# Service Manual

***General Description***
***Adjustment Procedures***
***Block / Schematic Diagrams***
***Exploded Views / Parts List***

Video Cassette Recorder
**LOEWE VHS**
PAL/NTSC
**Hi-Fi HQ**
VV5306H

**Z-MECHANISM**

## SPECIFICATIONS

| ITEM | SPECIFICATIONS |
|---|---|
| POWER | SOURCE: 220-240 V AC 50/60Hz |
| | CONSUMPTION: 21 watts<br>CONSUMPTION WHEN IN STANDBY MODE: Approx. 3 watts |
| RECORDING SYSTEM | 2 rotary heads, helical scanning system |
| | PAL |
| TV TUNER SYSTEM | VHF: CH E 2–CH E 12<br>CH A–CH H2 (ITALY) (PAL/SECAM B)<br>UHF: CH 21–CH 69 (PAL/SECAM G)<br>CATV: CH S01–CH S41 (PAL/SECAM B) |
| RF OUT SYSTEM | UHF: CH 21–CH 69 (PAL/SECAM G)<br>71 ±3 dBμ, 75Ω close |
| VIDEO | HEADS: 4 rotary heads<br>1 pair for recording and playback<br>(L-R heads)<br>1 pair for trick play<br>(L'-R' heads) |
| | INPUT: EURO AV (AV1, AV2) Connector (21 pin)<br>1.0 Vp-p, 75Ω terminated<br>VIDEO IN (AV3: FRONT) Connector<br>1.0 Vp-p, 75Ω terminated |
| | OUTPUT: EURO AV (AV1, AV2) Connector (21 pin)<br>1.0 Vp-p, 75Ω terminated |

| ITEM | SPECIFICATIONS |
|---|---|
| AUDIO | HEAD: 1 Stationary head (Normal-mono only)<br>2 channels (Hi-Fi Sound-Stereo) |
| | INPUT: EURO AV (AV1, AV2) Connector (21 pin)<br>More than -6dBV (500 mV), 10 kΩ<br>AUDIO IN (AV3: FRONT) Connector<br>More than -6dBV (500 mV), 10 kΩ |
| | OUTPUT: AUDIO OUT Connector (Phono type)<br>-6dBV (500 mV), Less than 1 kΩ<br>EURO AV (AV1, AV2) Connector (21 pin)<br>-6dBV (500 mV), Less than 1 kΩ |
| TAPE SPEED | SP: 23.39 mm/s<br>LP: 11.695 mm/s<br>Record/Playback Time:<br>SP: 4 hours with 240 min. type tape<br>LP: 8 hours with 240 min. type tape<br>FF/REW Time:<br>90 sec. with 180 min. type tape |
| OPERATIONG TEMPERATURE | 5°C — 40°C |
| OPERATIONG HUMIDITY | 35%—80% |
| DIMENSIONS | 430 (W) x 93.5(H) x 295.5(D)mm: |
| WEIGHT | 4.1 kg |
| STANDARD ACCESSORIES | 1 pc. DIN-RF Cable<br>1 pc. AC Mains Lead<br>1 pc. Infra-res Remote Control |

**LOEWE.**

230-90358.995

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# 1 INTRODUCTION

This service manual contains technical information which will allow service personnel to understand and service this model.

If the circuit is changed or modified, this information will be followed by supplementary service manual to be filed with original service manual.

**Note:**

1. Adjustment procedures, Disassembly Procedures and Assembly Procedures for Mechanism Chassis are separate volume from this service manual.
   Please refer to the service manual for Z-Mechanism Chassis. (Order No. VRD9802005C2)
2. The Model No. is indicated on the Schematic Diagram and Circuit Board Diagrams as follows.

   **VV5306H/HH/HS**

# 2 GENERAL DESCRIPTIONS

## 2.1. SERVICE INFORMATION

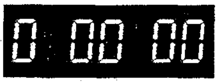
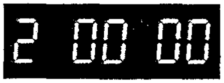
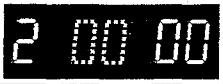
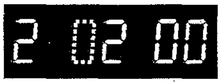
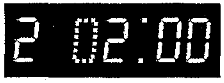
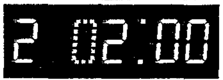
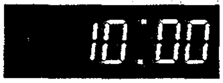
### 2.1.1. CHANNEL MEMORY IC INITIALIZATION

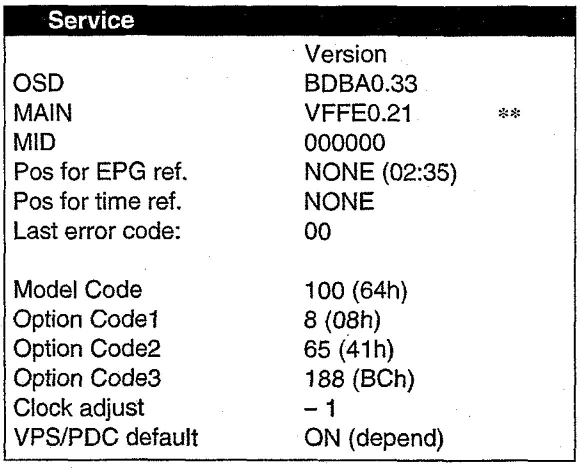
When replacing the Memory IC7801 and/or Oscillator X6001, Memory IC7801 has to be initialized due to the setting value changes.

**Note:**

1. **When replacing the memory IC7801, the OSD microprocessor IC7701 should be replaced together.**
2. It has to be performed before tuning.
3. Meaning of "MEMORY IC INITIALIZATION" is to make dependency in different models and to distinguish between different features.
4. It does not need to perform when replacing the System Control IC6001.

<CHANNEL MEMORY IC INITIALIZATION>

| PROCEDURES | FIP Display | Monitor Screen |
|---|---|---|
| Press the FF and EJECT keys simultaneously for 3 seconds. |  | None |
| Press the FF and EJECT keys simultaneously more twice. |  | None |
| Press the EJECT key for 3 seconds. |  | None |
| Press the CH UP key on the Remote Controller unit twice. |  | None |
| Press the POWER key. |  <br>(Colon starts flashing) | Service Screen (See Fig. S1) |
| Set the Model Code and Option Code by pressing 10-key or [RIGHT] [LEFT] [UP] [DOWN] keys on the Remote Controller Unit. (See Fig.S2) |  | Service Screen (See Fig.S1) |
| To release Service Mode, press the POWER key and then press the FF and EJECT keys simultaneously 6 times until the normal indication on the FIP. |  | None |



**Service**

| | Version | |
|---|---|---|
| OSD | BDBA0.33 | |
| MAIN | VFFE0.21 | ** |
| MID | 000000 | |
| Pos for EPG ref. | NONE (02:35) | |
| Last error code: | 00 | |
| Pos for time ref. | NONE | |
| Model Code | 100 (64h) | |
| Option Code1 | 8 (08h) | |
| Option Code2 | 65 (41h) | |
| Option Code3 | 188 (BCh) | |
| Clock adjust | - 1 | |
| VPS/PDC default | ON (depend) | |

Fig.S1 Service Secreen (sample)

| Model No. | Model Code | Option Code 1 | Option Code 2 | Option Code 3 |
|---|---|---|---|---|
| VV5306H/HH/HS | 110 | 138 | 65 | 180 |

Fig. S2 Model Code & Option Code

## 2.1.2. CYLINDER UNIT REPLACEMENT

1. CYLINDER UNIT REPLACEMENT
   - a. Remove the mechanism unit from MAIN C.B.A./Chassis by referring "SECTION 2. Disassembly Procedure".
   - b. Remove the 3 screws (A) of the CYLINDER UNIT with a screw driver.
   - c. Unlock the 4 locking tabs (B) and disconnect the Cylinder flexible card from the FPC Holder.
   - d. Remove the CYLINDER UNIT.

   **CAUTION:**

   **Handle the Cylinder flexible card with care. When it damaged, you should replace whole Cylinder unit.**

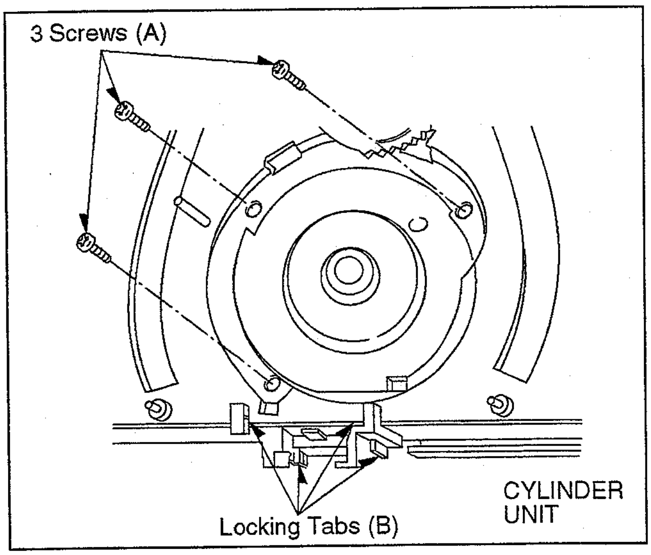

3 Screws (A)
Locking Tabs (B)
CYLINDER UNIT

Fig. S3

2. UPPER CYLINDER DISASSEMBLY
   - a. Remove 2 screws (A).
   - b. Remove the Cylinder Stator Unit.
   - c. Remove 2 screws (B).
   - d. Remove the Cylinder Rotor Unit.
   - e. Loose Hex screw (C) (1.5 mm) and remove the CYLINDER RETAINER.
   - f. Remove the Upper Cylinder.

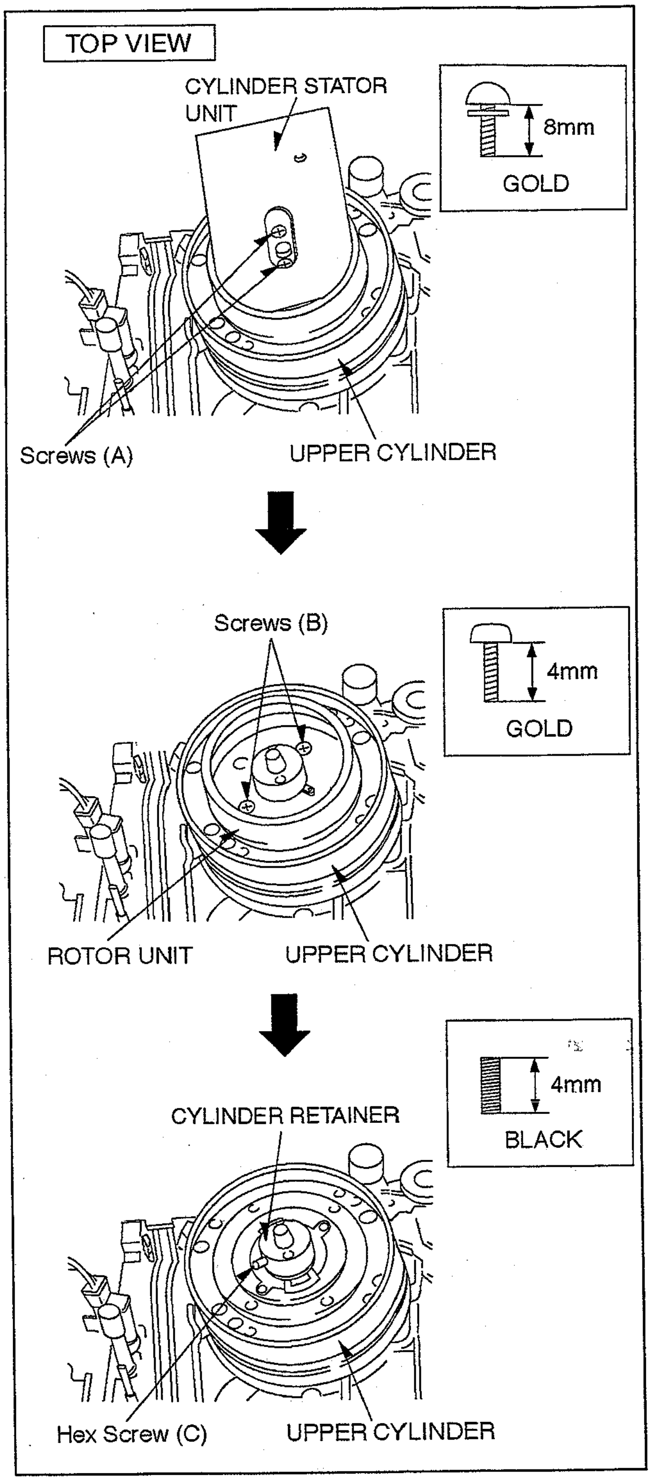

TOP VIEW
CYLINDER STATOR UNIT
8mm
GOLD
Screws (A)
UPPER CYLINDER
Screws (B)
4mm
GOLD
ROTOR UNIT
UPPER CYLINDER
CYLINDER RETAINER
4mm
BLACK
Hex Screw (C)
UPPER CYLINDER

Fig. S4

3. UPPER CYLINDER ASSEMBLY

   When reassembling, perform the steps in the reverse order.

   **Notes:**
   - a. Install the Cylinder Retainer so that the 2 holes on top of the Cylinder Retainer are at right angles with the P3502 Connection.
   - b. Tighten the Hex screw (C) (1.5 mm) while pressing down on top of the Cylinder Retainer.

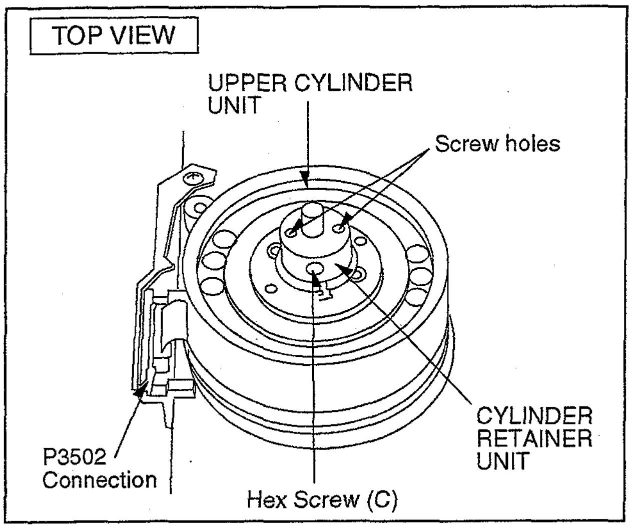

TOP VIEW
UPPER CYLINDER UNIT
Screw holes
CYLINDER RETAINER UNIT
P3502 Connection
Hex Screw (C)

Fig. S5

c. Install the Cylinder Rotor Unit so that the inner hole of the Cylinder Rotor Unit fits to the small projection (D) on top of the Upper Cylinder.

d. Tighten 2 screws (B).

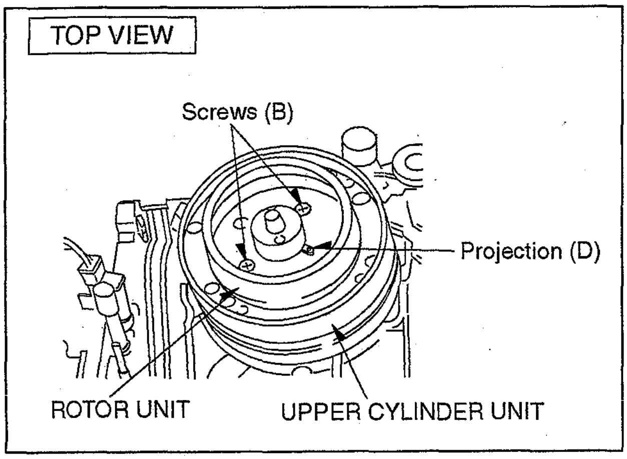

TOP VIEW
Screws (B)
Projection (D)
ROTOR UNIT
UPPER CYLINDER UNIT

Fig. S6

e. install the Cylinder Stator Unit.

f. Tighten 2 screws (A).

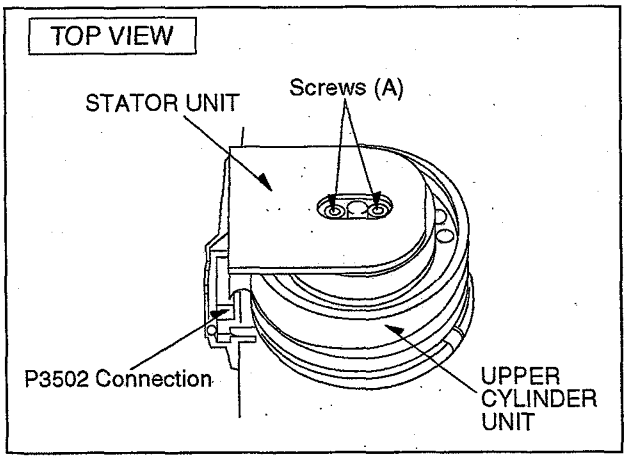

TOP VIEW
STATOR UNIT
Screws (A)
P3502 Connection
UPPER CYLINDER UNIT

Fig. S7

g. Confirm the PG SHIFTER ADJUSTMENT with the alignment tape (PAL: VFJ8125H3F) and adjust it if necessary.

## 2.1.3. CHECKING OF MAIN C.B.A.

When servicing the MAIN C.B.A., take out the MAIN C.B.A. and mechanism from the frame and turn over.

And then connect the Extension Cable (VFK2744) between the POWER C.B.A. connector (P1103) and the MAIN C.B.A. connector (P1001) as shown in Fig.S8.

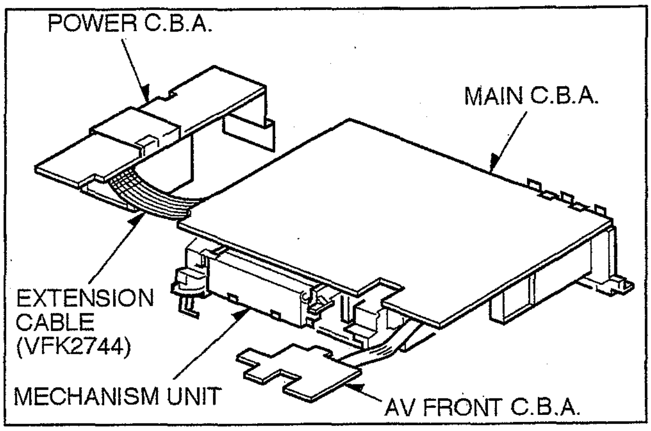

POWER C.B.A.
MAIN C.B.A.
EXTENSION CABLE (VFK2744)
MECHANISM UNIT
AV FRONT C.B.A.

Fig. S8

## 2.1.4. FLAT CARD CABLE INSTALLATION

When installing the Flat Card Cable on the connector, install the Flat Card Cable with the cable contacts facing the connector contacts.

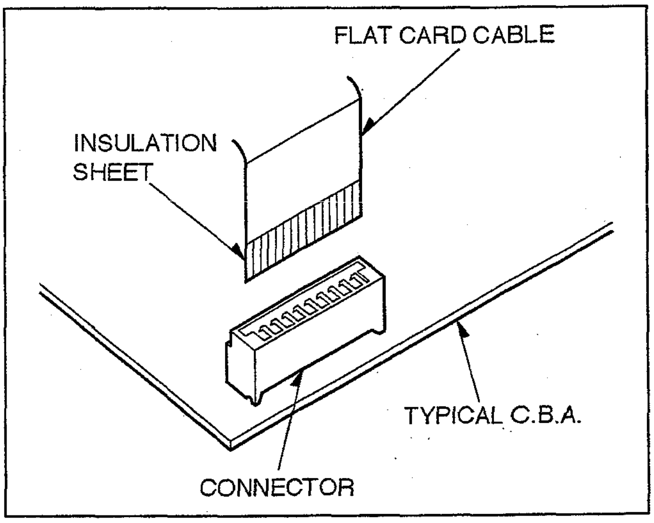

FLAT CARD CABLE
INSULATION SHEET
TYPICAL C.B.A.
CONNECTOR

Fig. S9

## 2.2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

1. Service Information Display Operation
   - a. Press the FF and EJECT keys simultaneosly for 3 seconds and set the Service Mode 7.
   - b. Press STOP key in order to rotate the Loading Motor for unloading operation. (Pay an attention of tape slack)
2. Manual Operation
   - a. Disconnect the AC Mains Lead and remove the Top Panel.
   - b. Rotate the Main Cam Gear clockwise until the Loading Posts move to fully unloaded position as shown in Fig.S10. (Tape is remaining)

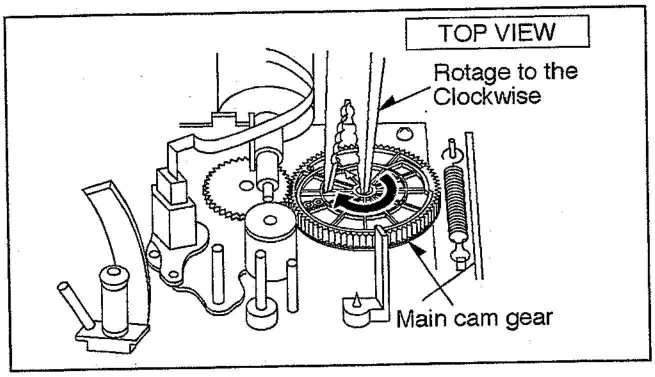


Fig. S10

   - c. Rotate the Capstan Motor clockwise from the bottom side to take up the tape.

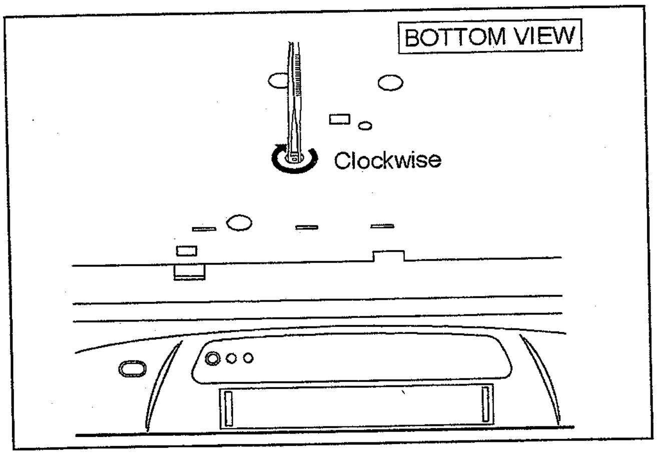


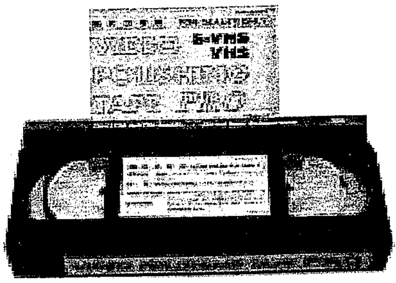
Fig. S11

   - d. Rotate the Main Cam Gear clockwise until the cassette tape is ejected.

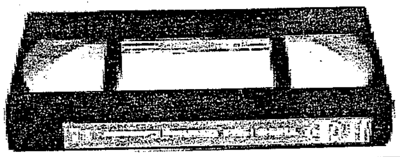
## 2.3. INTRODUCTION OF VIDEO HEAD CLEANING CASSETTE (POLISHING TYPE)

1. We are pleased to introduce Panasonic Video Head Cleaning Cassette, **VFK0923FT** [for service purposes] and **VFK0923FSE** [ for end users] for all VHS/SVHS VCP and VCR.
2. These cleaning cassettes are exclusive removing the hard and sticky clogging on video heads.
3. These improve the efficiency of video head cleaning service and shortening cleaning time for end users.

| **VFK0923FT**<br>(For Service usage) | |
|---|---|
| Type of Cassette | Full VHS Cassette |
| Cleaning Time | 10 Seconds/Time |
| Tape Length | 20 m |
| Usability in a Path | 180 Times |



| **VFK0823FSE**<br>(For end users) | |
|---|---|
| Type of Cassette | Full VHS Cassette |
| Cleaning Time | 10 Seconds/Time |
| Tape Length | 3.34 m |
| Usability in a Path | 30 Times |



**Note:**

The tape material itself is the same in both types.

# 4 ADJUSTMENT PROCEDURES

## 4.1. DISASSEMBLY METHOD

### 4.1.1. DISASSEMBLY FLOW CHART

This flow chart indicates disassembly steps of the cabinet parts and the circuit boards in order to find the necessary items for servicing.

When reassembling, perform the steps in the reverse order.

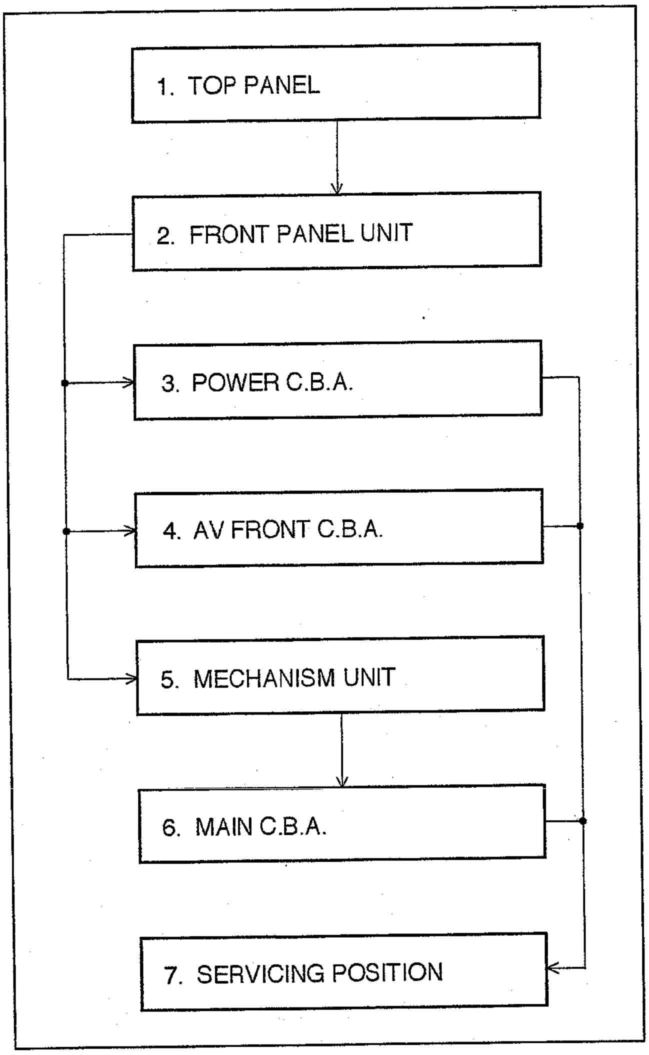

1. TOP PANEL
2. FRONT PANEL UNIT
3. POWER C.B.A.
4. AV FRONT C.B.A.
5. MECHANISM UNIT
6. MAIN C.B.A.
7. SERVICING POSITION

Fig. D1

### 4.1.2. DETAIL OF DISASSEMBLY METHOD

1. REMOVAL OF THE TOP PANEL

| | |
|---|---|
| Remove | 4 Screws (A) |

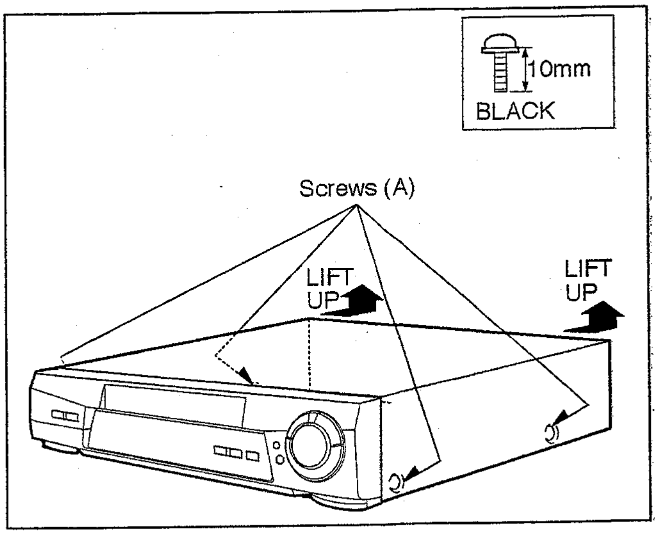

10mm
BLACK
Screws (A)
LIFT UP
LIFT UP

Fig.D2

2. REMOVAL OF THE FRONT PANEL UNIT

| | |
|---|---|
| Unlock | 7 Tabs (B) |

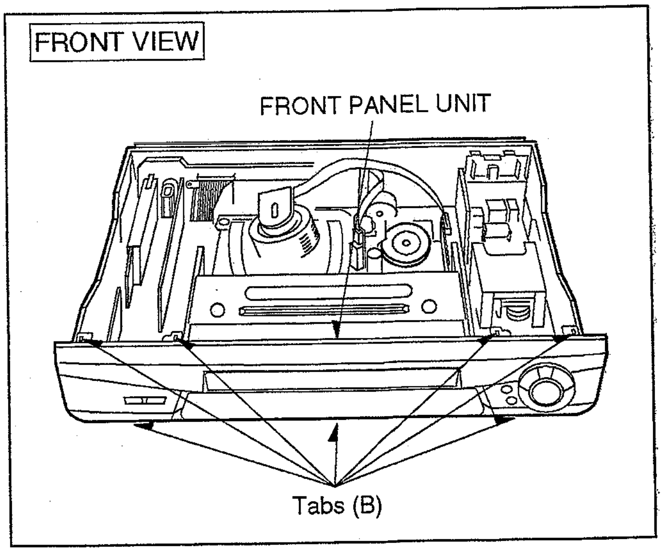

FRONT VIEW
FRONT PANEL UNIT
Tabs (B)

Fig. D3

## 3. REMOVAL OF THE POWER C.B.A.

| | |
|---|---|
| Disconnect | Bridge Connector (C) |
| Unlock | 6 Tabs (D) |

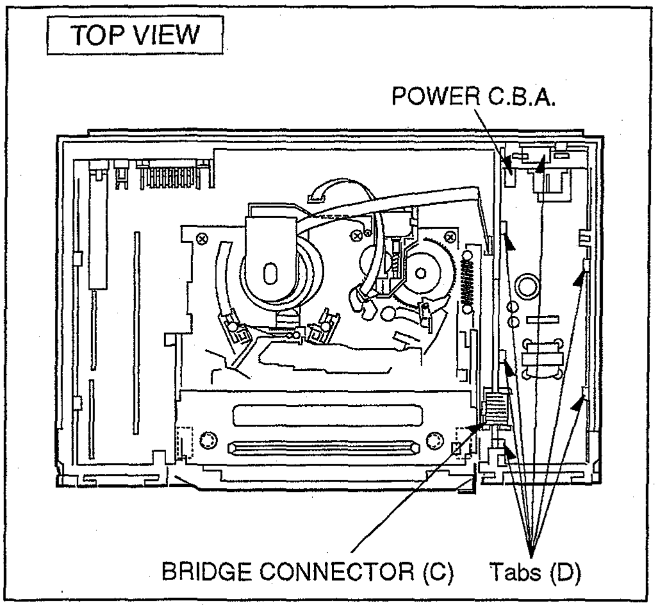

TOP VIEW
POWER C.B.A.
BRIDGE CONNECTOR (C)
Tabs (D)

Fig. D4

COUTIONS:

Please pay an attention to disconnect the connector (P1001-P1103) which connected between Main C.B.A. and Power supply unit as shown below.

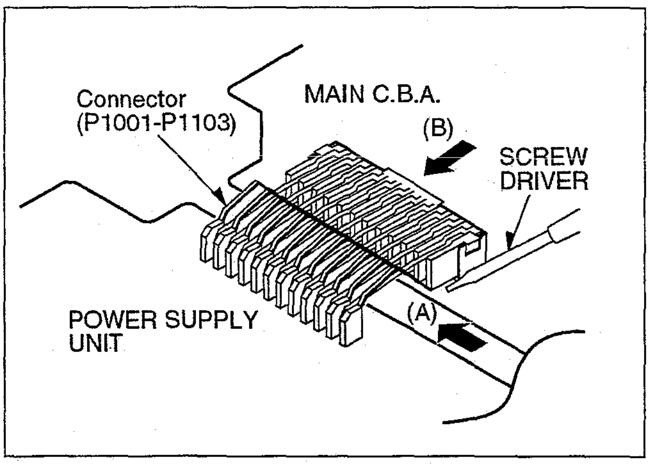

Connector
(P1001-P1103)
MAIN C.B.A.
(B)
SCREW
DRIVER
POWER SUPPLY
UNIT
(A)

Fig. D5

As above drawing, disconnect the connector by SCREW DRIVER from the direction (A).
Do not disconnect from direction (B) because it is possibility to damage the parts located by the connector.

## 4. REMOVAL OF THE AV FRONT C.B.A.

| REMOVAL OF THE AV FRONT C.B.A. | |
|---|---|
| Unlock | 2 Tabs (E) |

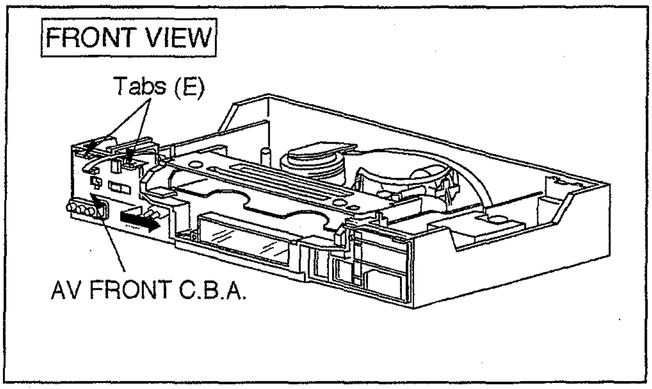

FRONT VIEW
Tabs (E)
AV FRONT C.B.A.

Fig. D6

## 5. REMOVAL OF THE MECHANISM UNIT

| | |
|---|---|
| Remove | 3 Screws (F) |
| Remove | 2 Screws (G) |
| Remove | Screw (H) |

**Note:**

a. Keep pressing 2 stoppers on Cassette Holder Plate and Press Cassette Holder Plate to the rear.

b. Remove the Mechanism Unit after bend the Cylinder Shield in the direction of the arrow.

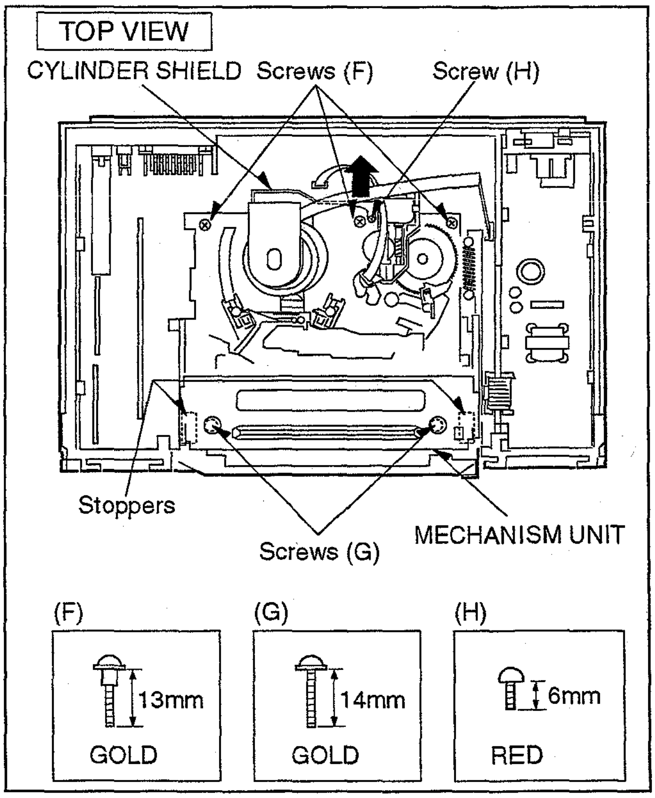

TOP VIEW
CYLINDER SHIELD
Screws (F)
Screw (H)
Stoppers
Screws (G)
MECHANISM UNIT
(F)
13mm
GOLD
(G)
14mm
GOLD
(H)
6mm
RED

Fig. D7

6. REMOVAL OF THE MAIN C.B.A.

| | |
|---|---|
| Disconnect | Bridge Connector (C) |
| Remove | Screw (I) |
| Unlock | 7 Tabs (J) |

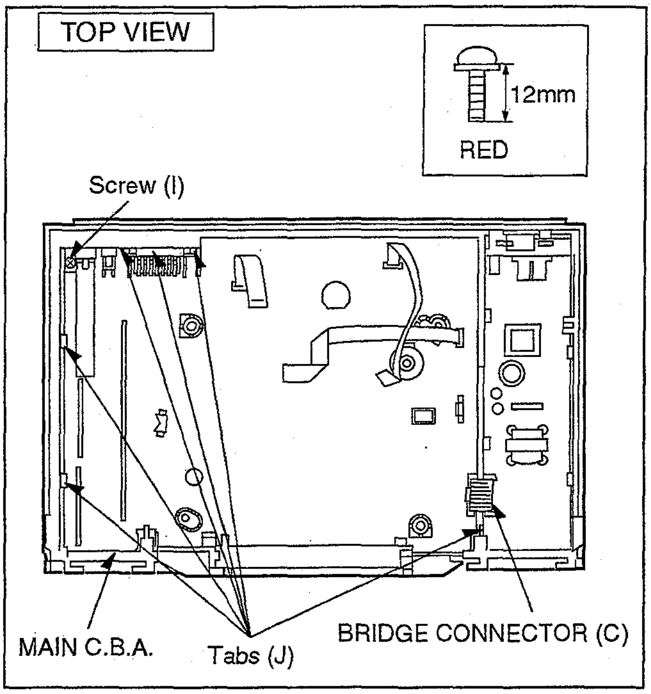

TOP VIEW
12mm
RED
Screw (I)
MAIN C.B.A.
Tabs (J)
BRIDGE CONNECTOR (C)

Fig. D8

7. SERVICING POSITION

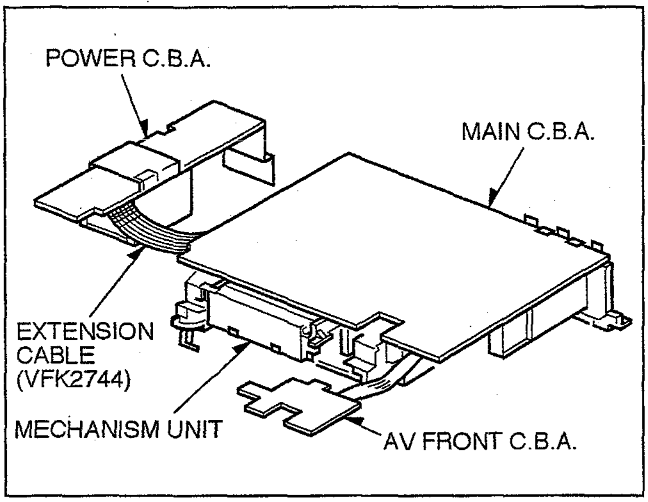

POWER C.B.A.
MAIN C.B.A.
EXTENSION CABLE (VFK2744)
MECHANISM UNIT
AV FRONT C.B.A.

Fig. D9

## 4.2. MECHANICAL ADJUSTMENT PROCEDURES

Refer to the Service Manual for Z-Mechanism Chassis. (Order No. VRD9802005C2)

# 4.3. ELECTRICAL ADJUSTMENT PROCEDURES

## 4.3.1. TEST EQUIPMENT

The following equipments are required for Electrical Adjustments.

1. Dual-Trace Oscilloscope
    - Voltage Range: 0.005-5V/div
    - Frequency Range: DC-35MHz
    - Probes: 10:1 / 1:1
2. Frequency Counter
    - Frequency Range: 0-10MHz
    - Probes: 1:1
3. Universal Counter
4. Digital Volt Meter (D.V.M.)
5. Video Sweep Generator
6. Sinewave Generator
7. Video Pattern Generator
8. Monitor TV
9. DC Power Supply
10. VHS Blank Tape
11. VHS Alignment Tape
    - Parts No.: VFJ8125H3F(PAL)

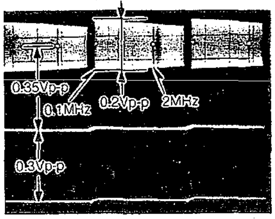
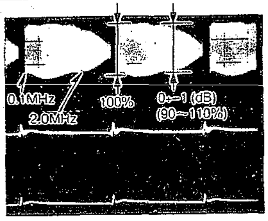
## 4.3.2. VCR SETTING

When no indication in the procedure, set each selector as follows.

1. TAPE SPEED: SP
2. CHANNEL: AV1/AV2/AV3
   (Set to signal input terminal number)

## 4.3.3. ADJUSTMENTS

| ITEM | TP | ADJ. | MODE | INPUT | TAPE | M. EQ. | SPEC. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| PG SHIFTER ADJUSTMENT | --- | --- | PLABACK | --- | ALIGNMENT TAPE (PAL) | --- | --- | Refer to procedure of PG SHIFTER ADJUSTMENT as shown in *Fig.*E3. |
| AI FUNCTION ADJUSTMENT | --- | --- | PLAYBACK (SELF-REC) | PAL COLOUR BAR | BLANK TAPE | --- | --- | Refer to the procedure of AI FUNCTION ADJUSTMENT as shown in Fig.E4. |
| VIDEO FREQUENCY RESPONSE ADJUSTMENT | VIDEO OUT | --- | SP/LP PLAYBACK (SELF-REC) | VIDEO SWEEP (See Fig.E1) | BLANK TAPE | OSCILLO SCOPE/ VIDEO SWEEP GENERAT OR | SP: 0+-1 (dB) (90~110%)<br>LP: 0+-1 (dB) (90~110%)<br>(See Fig. E2) | Refer to the procedure of VIDEO FREQUENCY RESPONSE ADJUSTMENT as shown in Fig. E5. |

| Fig.E1 | Fig.E2 |
|---|---|
|  <br>CONDITION: BURST SIGNAL OFF / 75 ohm TERMINATED |  |

## 4.3.4. PG SHIFTER ADJUSTMENT (AUTOMATIC)

| PROCEDURES | FIP Display |
|---|---|
| Press the FF and EJECT keys simultaneously for 3 seconds. | 0 00 00 |
| Press the FF and EJECT keys simultaneously twice. | 2 00 00 |
| Press the EJECT key for 3 seconds. | 2 00 00 |
| Press the CH UP key on the Remote Controller unit once. | 2 01 00 |
| Insert the Alignment Tape.<br>(PAL: VFJ81215H3F) | 2 01 00 |
| This adjustment is automatically started. (During the adjustment, the picture will be appeared on the monitor.) | 2 01 00 |
| When this Adjustment is terminated, the following operation will be activated.<br>• Adjustment completed: The tape will be ejected.<br>• Adjustment incompleted: "F2*" is indicated on the FIP.Check the Servo/System Control circuit and Cylinder Unit. | |
| To release Service Mode, press the FF and EJECT keys simultaneously 6 times until the normal indication on the FIP. | |

Fig. E3

## 4.3.5. AI FUNCTION ADJUSTMENT (AUTOMATIC)

| PROCEDURES | FIP Display |
|---|---|
| Press the FF and EJECT keys simultaneously for 3 seconds. | 0 00 00 |
| Press the FF and EJECT keys simultaneously twice. | 2 00 00 |
| Press the EJECT key for 3 seconds. | 2 00 00 |
| Press the CH UP key on the Remote Controller unit 3 times. | 2 03 00 |
| Insert the Blank Tape. | 2 03 00 |
| This adjustment is automatically started. | 2 03 00 |
| When this Adjustment is terminated, the following operation will be activated.<br>• Adjustment completed: The VCR goes to STOP Mode. | |
| To release Service Mode, press the FF and EJECT keys simultaneously 6 times until the normal indication on the FIP. | |

Fig. E4

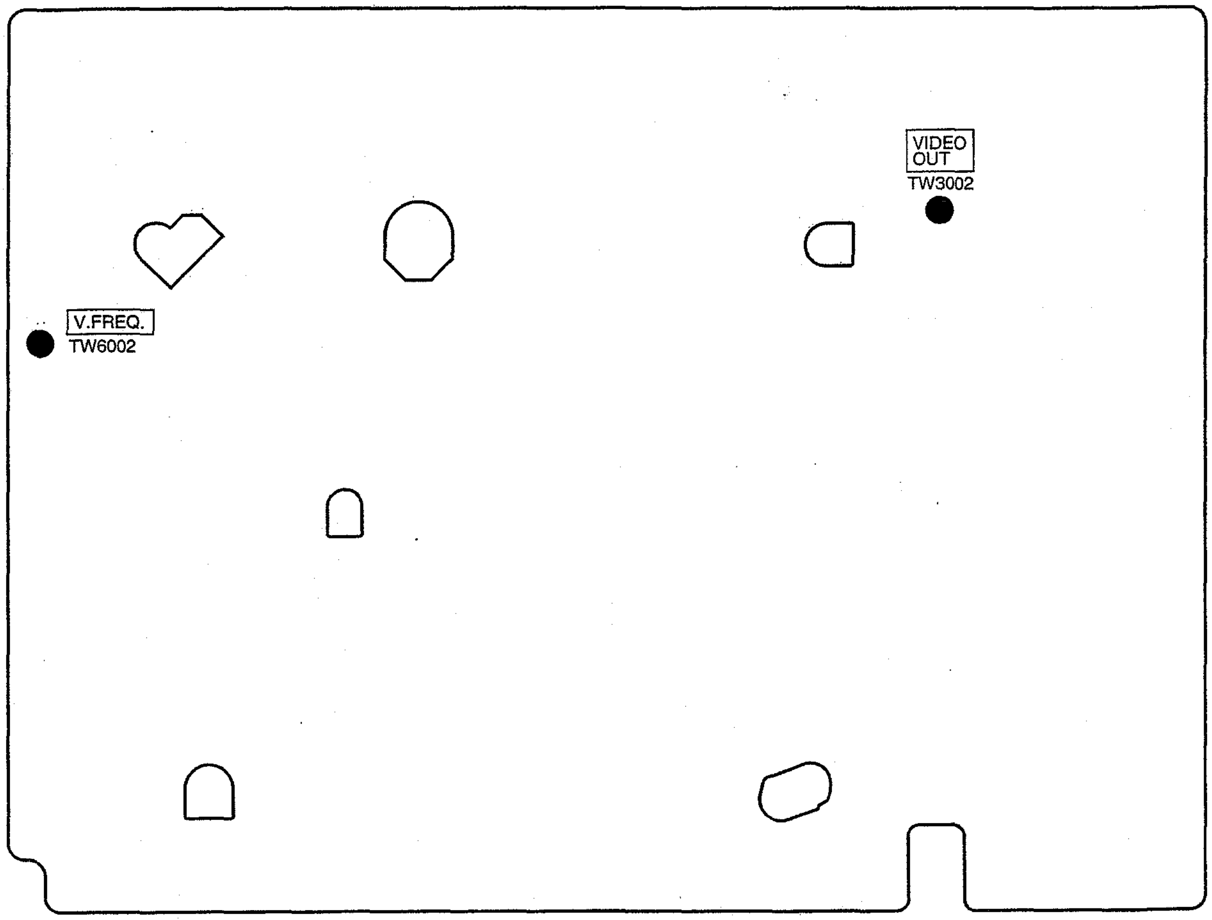
## 4.3.6. VIDEO FREQUENCY RESPONSE ADJUSTMENT

| PROCEDURES | FIP Display |
|---|---|
| Press the FF and EJECT keys simultaneously for 3 seconds. | 0 00 00 |
| Press the FF and EJECT keys simultaneously twice. | 2 00 00 |
| Press the EJECT key on the Remote Controller unit for 3 seconds. | 2 00 00 |
| Press the CH UP and/or CH DOWN key until "11" is displayed on the FIP. | 2 11 00 |
| Insert the Self-recorded tape and playback it. | 2 11 00 |
| Connect the Oscilloscope to:<br>*CH1....Video Out. (TW3002). *CH2....V.FREQ. (TW6002). | |
| Press the "4" key on the Remote Controller.<br>(Confirm that TW6002 becomes high (5V).) | |
| Adjust the Frequency response by pressing the "2" (increase) and/or "8" (decrease) key on the Remote Controller. | |
| Store the Adjusted value by pressing "5" key on the Remote Controller. | |
| Release the Service mode by pressing the EJECT and FF keys simultaneously 6 times until the FIP becomes normal indication. | |

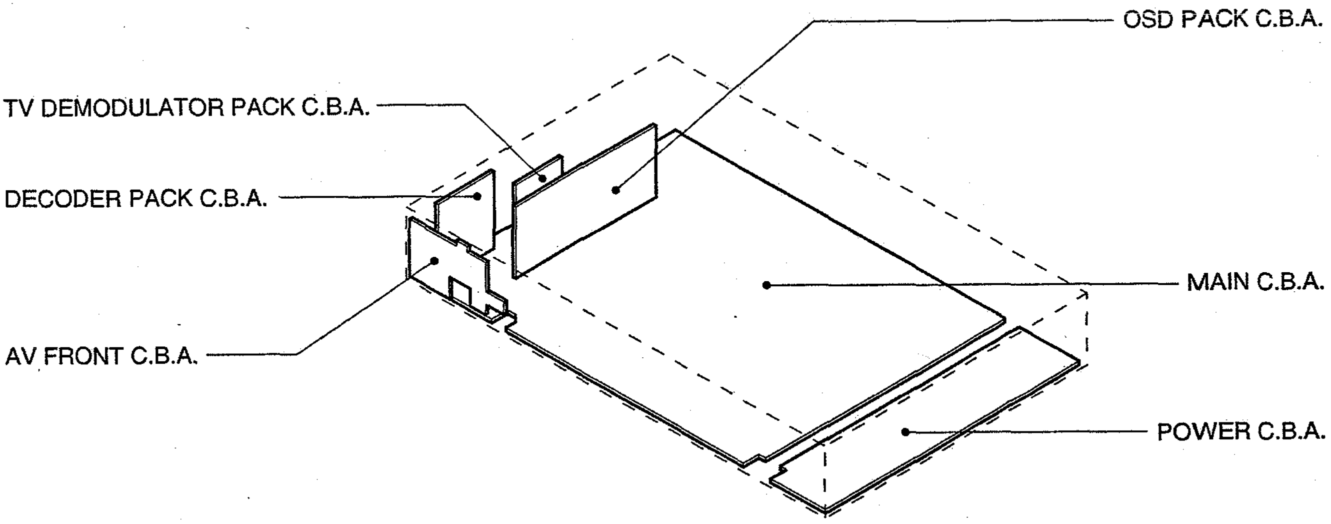
Fig. E5

## 4.3.7. LOCATION OF TEST POINTS & CONTROLS

**MAIN C.B.A.**


VIDEO OUT
TW3002
V.FREQ.
TW6002

## 4.3.8. CIRCUIT BOARD LAYOUT


OSD PACK C.B.A.
TV DEMODULATOR PACK C.B.A.
DECODER PACK C.B.A.
MAIN C.B.A.
AV FRONT C.B.A.
POWER C.B.A.

# 5 ABBREVIATIONS

| | |
|---|---|
| 443NT [L] | 4.43 NTSC Ⓛ |
| A. COMP | AUDIO COMPONENT SIGNAL |
| A. COMPO | AUDIO COMPONENT SIGNAL |
| A. D.P [L] | AUDIO DUBBING PAUSE Ⓛ |
| A. D/L [L] | AUDIO DUBBING PAUSE Ⓛ |
| A. DEF [S] | AUDIO DEFEAT |
| A. DEF [S] [L] | AUDIO DEFEAT |
| A. DUB P [L] | AUDIO DUBBING PAUSE Ⓛ |
| A. DUB [H] | AUDIO DUBBING Ⓗ |
| A. ERASE | AUDIO ERASE |
| A. H. SW | AUDIO HEAD SWITCHING PULSE |
| A. HEAD [R] | AUDIO HEAD (REC) |
| A. HEAD [W] | AUDIO HEAD (PLAY) |
| A. IN [L] | AUDIO INPUT (L) |
| A. IN [R] | AUDIO INPUT (R) |
| A. MUT [H] | AUDIO MUTE Ⓗ |
| A. MUTE [H] | AUDIO MUTE Ⓗ |
| A. OUT [L] | AUDIO OUTPUT (L) |
| A. OUT [R] | AUDIO OUTPUT (R) |
| A. RF OUT | AUDIO RF SIGNAL OUTPUT |
| A/VS/S. DATA | AV SW/SERIAL DATA |
| AC ONLINE | AC ONLINE |
| AC. O/EE. H | AC ONLINE/EE Ⓗ |
| AFC S C | AFC S CURVE |
| AFC [S] | AFC S CURVE |
| AFC. DEF | AFC DEFEAT |
| ARFC OUT | AUDIO RF SIGNAL OUTPUT |
| ART. V | ARTIFICIAL VERTICAL SYNC SIGNAL |
| ART. V. MM | ARTIFICIAL VERTICAL SYNC SIGNAL MONO MULTI |
| ART. V/H/N | ARTIFICIAL VERTICAL SYNC SIGNAL Ⓗ/NORMAL |
| AT. V/H/N | ARTIFICIAL VERTICAL SYNC SIGNAL |
| ATSW/TEST/NOR/SE | TEST/NORMAL/SERVICE |
| AUDIO IN [L] | AUDIO INPUT (L) |
| AUDIO IN [R] | AUDIO INPUT (R) |
| AUDIO OUT [L] | AUDIO OUTPUT (L) |
| AUDIO OUT [R] | AUDIO OUTPUT (R) |
| AUDIO SELECT [H] | AUDIO SELECT Ⓗ |
| AUDIO. L | AUDIO (L) |
| AUDIO. R | AUDIO (R) |
| AV CNT | AV CONTROL |
| AV CTL | AV CONTROL |
| AV CTL/S. CLK | AV CONTROL/SERIAL CLOCK |
| AV. C.M. | AV CONTROL MODE |
| AVCNT/METER. R | AV CONTROL/LEVEL METER (R) |
| AVSW/METER. L | AV SW/LEVEL METER (L) |
| B MODE. H | B MODE Ⓗ |
| B.G.P | BURST GATE PULSE |
| BACKUP 5V | BACK UP 5V |
| BAND. U.E. | BAND U |
| BANDVL. D | BAND VL |
| BI/MI [L] | BILINGUAL/MIX Ⓛ |
| BIL | BILINGUAL |
| BIL [L] | BILINGUAL Ⓛ |
| BIL. [H] | BILINGUAL Ⓗ |
| BIL/M1 [L] | BILINGUAL Ⓛ |
| BS CLOCK | BS CLOCK |
| BS DATA | BS DATA |
| BS LCH IN | BS L CHANNEL INPUT |
| BS MIX [H] | BS MIX Ⓗ |
| BS MON [H] | BS MONITOR Ⓗ |
| BS MONI [H] | BS MONITOR Ⓗ |
| BS RCH IN | BS R CHANNEL INPUT |
| BS VIDEO | BS VIDEO SIGNAL |
| BS VIDEO/BS1 | BS VIDEO SIGNAL |
| BS [H] | BS Ⓗ |
| BS. LEVEL | BS LEVEL |
| BS. M [H] | BS MONITOR Ⓗ |
| BS/VTR [H] | BS/VTR Ⓗ |
| BUS CLK | BUS CLOCK |
| BUS LSN | BUS LISTEN |
| BUS TLK | BUS TALK |
| BUZZER | BUZZER |
| CAP EC | CAPSTAN TORQUE CONTROL |
| CAP M GND | CAPSTAN MOTOR GND |
| CAP. ET | CAPSTAN TORQUE CONTROL |
| CAP. FG1 | CAPSTAN FG1 PULSE |
| CAP. FG2 | CAPSTAN FG2 PULSE |
| CAS. SW | CASSETTE SW |
| CCN | PLAYBACK CONTROL SIGNAL (–) |
| CCP | PLAYBACK CONTROL SIGNAL (+) |
| CHM | CONTROL SIGNAL (+) |
| CHP | CONTROL SIGNAL (–) |
| CINEM [L] | CINEMA Ⓛ |
| CINEMA [L] | CINEMA Ⓛ |
| CINEMA/MIX | CINEMA/MIX |
| CKL | RATCH LOCK |
| CKS | SHIFT LOCK |
| CL | CLOCK |
| CLK | CLOCK |
| CLK (C.G) | CLOCK |
| CLOCK. IN | CLOCK INPUT |
| CLP | CLAMP |
| COL/B/W/NOR | COLOUR/BLACK & WHITE/NORMAL |
| COLOR [H] | COLOUR Ⓗ |
| CONV | CONVERTOR |
| CS | CHIP SELECT |
| CTL GND | CONTROL GND |
| CTL HEAD [+] | CONTROL HEAD (+) |
| CTL HEAD [–] | CONTROL HEAD (–) |
| CTL [+] | CONTROL HEAD (+) |
| CTL [–] | CONTROL HEAD (–) |
| CUE BIAS | CUE BIAS |
| CURRENT LIM | CURRENT LIMMITER |
| CYL ET | CYLINDER TORQUE CONTROL |

| | |
|---|---|
| CYL GND | CYLINDER GND |
| D.F.M. REC [H] | DELAIED FM RECORDING Ⓗ |
| D. FM REC [L] | DELAIED FM RECORDING Ⓛ |
| D. GND | DIGITAL GND |
| D. REC [H] | DELAYED RECORDING Ⓗ |
| D4/S. LED | D4/STILL LED |
| D4/STILLED | D4/STILL LED |
| DAC [CLK] | TUNER DAC (CLOCK) |
| DAC/FSCS | TUNER DAC/FS CHIP SELECT |
| DAREC [H] | DELAYED AUDIO RECORDING Ⓗ |
| DATA | DATA |
| DECODER [L] | DECODER (L) |
| DECODER [R] | DECODER (R) |
| DEW | DEW |
| DEW SNS | DEW SENSOR |
| DFMRE [H] | DELAYED FM AUDIO RECORDING Ⓗ |
| E. REC 5V | EXCEPT RECORDING 5V |
| EC | ERROR TORQUE CONTROL |
| ECR | ERROR TORQUE CONTROL REFERENCE VOLTAGE |
| EDT TRIG [L] | EDIT TRIGGER Ⓛ |
| EDIT [H] | EDIT Ⓗ |
| EE [H] | EE Ⓗ |
| EE [H]/INS [M] | EE Ⓗ/INSERT Ⓜ |
| EE. VV. TR | EE/VV/TRICK PLAY |
| EJECT. PO. | EJECT POSITION |
| EJECT/VDET | EJECT/REVERSE SLOW LOCK |
| ENV. SEL | ENVELOPE SELECT |
| ENVE. OUT | ENVELOPE OUTPUT |
| ENVE. SEL | ENVELOPE SELECT |
| ENV SELECT | ENVELOPE SELECT |
| EP [H] | LP Ⓗ |
| EP/LP [H] | LP Ⓗ |
| EP/LP/SP | LP/SP |
| EP/SS [H] | LP/SLOW/STILL/STOP Ⓗ |
| EPROMCS | EPROM CHIP SELECT |
| EX. REC 5V | EXCEPT RECORDING 5V |
| FF/REW [L] | FIRST FORWARD/REWIND Ⓛ |
| FG1 IN | FG1 PULSE INPUT |
| FG2 IN | FG2 PULSE INPUT |
| FILTER ADJUSTMENT | FILTER ADJUSTMENT |
| FLY ERASE [H] | FLYING ERASE HEAD ON Ⓗ |
| FLY ON [H] | FLYING ERASE HEAD ON Ⓗ |
| FLY. E [H] | FLYING ERASE HEAD ON Ⓗ |
| FM MUT [H] | FM AUDIO MUTE Ⓗ |
| FM MUTE [H] | FM AUDIO MUTE Ⓗ |
| FM OUT [L] | FM OUTPUT (L) |
| FM OUT [R] | FM OUTPUT (R) |
| FM PACK OUT [L] | FM PACK OUTPUT (L) |
| FM PACK OUT [R] | FM PACK OUTPUT (R) |
| FM/BS SEL [L] | FM/BS SELECT (L) |
| FM/BS SEL [R] | FM/BS SELECT (R) |
| FS. CLK | FS CLOCK |
| FUL. E [H] | FULL ERASE HEAD ON Ⓗ |
| FULL. E [H] | FULL ERASE HEAD ON Ⓗ |

| | |
|---|---|
| FULL. E. 12V | FULL ERASE 12V |
| GND [A] | GND (ANALOG) |
| GND [TU] | GND (TUNER) |
| GND/N. SW. 12V | GND/NON SW 12V |
| H. SYNC | HORIZONTAL SYNC |
| H. AMP. SW | HEAD AMP SW PULSE |
| H. P <R> | HEAD PHONE (R) |
| H. P <L> | HEAD PHONE (L) |
| H. P GND | HEAD PHONE GND |
| H. P OUT [L] | HEAD PHONE OUTPUT (L) |
| H. P OUT [R] | HEAD PHONE OUTPUT (R) |
| H. SW | HEAD SW PULSE |
| HEAD PHONE [L] | HEAD PHONE (L) |
| HEAD PHONE [R] | HEAD PHONE (R) |
| HEAD SW | HEAD SW |
| HEATER [+] | HEATER (+) |
| HEATER [–] | HEATER (–) |
| HSS | HORIZONTAL SYNC SIGNAL |
| HTR [+] | HEATER (+) |
| HTR [–] | HEATER (–) |
| I RFE | REFERENCE CURRENT |
| ICL | CONTROL AGC CIRCUIT |
| IF | INTERMEDIATE FREQUENCY |
| IN SELA1 | INPUT SELECT A1 POSITION |
| IN SELA2 | INPUT SELECT A2 POSITION |
| IN SELA3 | INPUT SELECT A3 POSITION |
| INS L/R [L] | INSERT Lch/Rch Ⓛ |
| INS. [H] | INSERT Ⓗ |
| INSEL A1 | INPUT SELECT A1 POSITION |
| INSEL A2 | INPUT SELECT A2 POSITION |
| INSERT | INSERT |
| INSERT [H] | INSERT Ⓗ |
| IO CS | INPUT/OUTPUT CHIP SELECT |
| JOG1 | JOG1 |
| JOG S3 LED/FOWRD | JOG LED/FORWARD LED |
| JOG/F. LED | JOG LED/FORWARD LED |
| JSB [H] | JSB Ⓗ |
| JST. CLCK | JUST CLOCK |
| JST. CLK | JUST CLOCK |
| JST. CLOCK | JUST CLOCK |
| L. OUT | Lch OUTPUT |
| L. CH [H] | Lch Ⓗ |
| L. CH [L] | Lch Ⓛ |
| LED (MAIN) | LED (MAIN) |
| LED (STEREO) | LED (STEREO) |
| LED (SUB) | LED (SUB) |
| LED CKL | LED SERIAL CLOCK |
| LED CKS | LED SERIAL CLOCK |
| LED DATA | LED SERIAL DATA |
| LINE IN 1 [L] | LINE INPUT 1 (L) |
| LINE IN 1 [R] | LINE INPUT 1 (R) |
| LINE IN 2 [L] | LINE INPUT 2 (L) |
| LINE IN 2 [R] | LINE INPUT 2 (R) |
| LINE IN V | LINE INPUT VIDEO |
| LINE IN [L] | LINE INPUT (L) |

| | |
|---|---|
| LINE IN [R] | LINE INPUT (R) |
| LINE OUT [L] | LINE OUTPUT (L) |
| LINE OUT [R] | LINE OUTPUT (R) |
| LP [H] | LP Ⓗ |
| LPTRI [L] | LP TRICK PLAY Ⓛ |
| Lch/A. DUB | Lch/AUDIO DUBBING |
| M GND | MOTOR GND |
| M REG | MOTOR REGULATOR |
| MAIN OUT | MAIN OUTPUT |
| MAIN [L] | MAIN Ⓛ |
| MAIN/MONO | MAIN/MONAURAL |
| MAX IN | MAXIMAM INPUT |
| MES [H] | MESECAM Ⓗ |
| MESE [H] | MESECAM Ⓗ |
| MESE [L] | MESECAM Ⓛ |
| METER 5V | LEVEL METER 5V |
| METER [L] | LEVEL METER (L) |
| METER [R] | LEVEL METER (R) |
| METER. L/AVS | LEVEL METER (L) |
| METER. R/AVC | LEVEL METER (R) |
| MI/BI [L] | MIX Ⓗ/BILIGUAL |
| MIC GND | MIC GND |
| MIC IN | MIC INPUT |
| MIC IN [L] | MIC INPUT (L) |
| MIC IN [R] | MIC INPUT (R) |
| MIC [H] | MIC Ⓗ |
| MIX [H] | MIX Ⓗ |
| MIX [H]/CINEMA [L] | MIX Ⓗ/CINEMA SOUND Ⓛ |
| MIX/CINE | MIX Ⓗ/CINEMA SOUND Ⓛ |
| MIX/CINEMA [L] | MIX Ⓗ/CINEMA SOUND Ⓛ |
| MN. H/M. L | MONAURAL Ⓗ/MAIN Ⓛ |
| MN. H/MAI. L | MONAURAL Ⓗ/MAIN Ⓛ |
| MN2/MES. L | MONAURAL 2/MESECAM Ⓛ |
| MODE SEL | AUDIO MODE SELECT |
| MODE SW | AUDIO MODE SW |
| MODE. S. IN | AUDIO MODE SELECT INPUT |
| MODE. S. OUT | AUDIO MODE SELECT OUTPUT |
| MONO [H] | MONAURAL Ⓗ |
| MONO [H]/MAIN [L] | MONAURAL Ⓗ/MAIN Ⓛ |
| MONO2 [L] | MONAURAL 2 |
| MONO2/MESE [FM(L)] | MONAURAL 2/MESECAM (FM Ⓛ) |
| MOTOR GND | MOTOR GND |
| MUTE | MUTE |
| N. A. REC [L] | NORMAL AUDIO RECORDING |
| N. SW 12V | NON SW 12V |
| N. SW. 5. DET | NON SW 5V DETECT |
| NICAM | NICAM |
| NICAM [L] | NICAM Ⓛ |
| NOL [H] | PAL Ⓗ/4.43 NTSC Ⓜ/3.58 NTSC Ⓛ |
| NOR/SOFT [H] | NORMAL/SOFT TAPE PLAY Ⓗ |
| NORMAL [H] | NORMAL Ⓗ |
| NR BIAS | NR BIAS |
| NTSC [L] | NTSC Ⓛ |
| OCH | CONTROL AGC CIRCUIT |
| OUT | OUTPUT |
| P-OFF [H] | POWER OFF Ⓗ |
| P-OFF [L] | POWER OFF Ⓛ |
| P. FAIL | POWER FAILURE DETECT |
| P. OFF [H] | POWER OFF Ⓗ |
| P. OFF [L] | POWER OFF Ⓛ |
| PAL [H] | PAL Ⓗ |
| PAL [L]/NTSC [H] | PAL Ⓛ/NTSC Ⓗ |
| PB ADJ OUT | PLAYBACK ADJUST OUTPUT |
| PB OUT | PLAYBACK OUTPUT |
| PB. H | PLAYBACK Ⓗ |
| PFG | PG/FG |
| PHOTSN +B | PHOTO SENSOR +B |
| PICT. CNT | PICTURE CONTROL |
| PLAY LED/RVS LED | PLAY LED/REVERSE LED |
| PLAY. PO | PLAY POSITION |
| PLAY/R. LED | PLAY LED/REVERSE LED |
| PLY/DEW | PLAY/DEW Ⓗ |
| POWER OFF [L] | POWER OFF Ⓛ |
| PREROLL [H] | PREROLL Ⓗ |
| PWRFAIL | POWER FAILURE DETECT |
| R. CH [H] | Rch Ⓗ |
| R. CH [L] | Rch Ⓛ |
| R. ST | RESET |
| R/S/F | REVERSE Ⓗ/STOP Ⓜ/FORWARD Ⓛ |
| RCH [H] | Rch Ⓗ |
| REC 12V | RECORDING 12V |
| REC CHROMA | RECORDING CHROMINANCE SIGNAL |
| REC H | RECORDING Ⓗ |
| REC IN | RECORDING INPUT |
| REC OUT [L] | RECORDING OUTPUT Ⓛ |
| REC START | RECORDING START |
| REC VR [C] | RECORDING VOLUME (COMMON) |
| REC VR [L] | RECORDING VOLUME (L) |
| REC VR [R] | RECORDING VOLUME (R) |
| REC Y | RECORDING LUMINANCE SIGNAL |
| REC [H] | RECORDING Ⓗ |
| REC. C | RECORDING CHROMINANCE SIGNAL |
| REC. Y | RECORDING LUMINANCE SIGNAL |
| REC/EE CTL | RECORDING/EE CONTROL |
| REEL-T | REEL PULSE (TAKE-UP) |
| REEL-S | REEL PULSE (SUPPLY) |
| REGULATOR FILTER | REGULATOR FILTER |
| RESET | RESET |
| REV M F/R | REVIEW MOTOR FORWARD/REVERSE |
| REV M V1 | REVIEW MOTOR V1 |
| REV M V2 | REVIEW MOTOR V2 |
| REV MOTOR F/R | REVIEW MOTOR FORWARD/REVERSE |
| REV MOTOR V1 | REVIEW MOTOR V1 |
| REV MOTOR V2 | REVIEW MOTOR V2 |
| REV MOTOR [+] | REVIEW MOTOR (+) |
| REV MOTOR [–] | REVIEW MOTOR (+) |
| REV. M. GND | REVIEW MOTOR GND |
| RF. CHROMA | RF CHROMINANCE SIGNAL |

| | |
|---|---|
| RF OUT | RF OUTPUT |
| RF Y | RF LUMINANCE SIGNAL |
| RF. Y. IN | RF LUMINANCE SIGNAL INPUT |
| RF. Y. OUT | RF LUMINANCE SIGNAL OUTPUT |
| ROTAR. SW | ROTARY SW |
| ROTARY | ROTARY SW |
| RST | RESET |
| RST [L] | RESET Ⓛ |
| Rch/INST | Rch/INSERT |
| S IN | SERIAL DATA INPUT |
| S OUT | SERIAL DATA OUTPUT |
| S-PHOTO | SUPPLY PHOTO TRANSISTOR |
| S-RL. PLS | SUPPLY REEL PULSE |
| S. CLK | SERIAL CLOCK |
| S. CLK/AV | SERIAL CLOCK/AV |
| S. DATA | SERIAL DATA |
| S. DATA/A | SERIAL DATA |
| S. PHOTO | SUPPLY PHOTO TRANSISTOR |
| S. TAB [L] | SAFETY TAB SW ON Ⓛ |
| S/P/N | SECAM/PAL/NTSC |
| SC IN | SERIAL CLOCK INPUT |
| SC OUT | SERIAL CLOCK OUTPUT |
| SCK SELECT | SERIAL CLOCK SELECT |
| SEL OUT [L] | SELECT OUTPUT (L) |
| SEL OUT [R] | SELECT OUTPUT (R) |
| SHUTTLE 1 | SHUTTLE 1 |
| SIF | SOUND INTERMEDIATE FREQUENCY |
| SLMUT [H] | INPUT SELECT MUTE Ⓗ |
| SLNID [+] | SOLENOID (+) |
| SLNID [–] | SOLENOID (–) |
| SLW TR. MM | SLOW TRACKING MONO MULTI |
| SLW TR. REF | SLOW TRACKING REFERENCE VOLTAGE |
| SNS. GND | SENSOR GND |
| SOFT [H] | SOFT TAPE PLAY Ⓗ |
| SOFT [H]/NORMAL | SOFT TAPE PLAY Ⓗ/NORMAL Ⓗ |
| SOLENOID ON [L] | SOLENOID ON Ⓛ |
| SP [H] | SP Ⓗ |
| SP/L/SLP | SP/LP |
| SSS [L] | SLOW/STILL/STOP |
| STEREO LED | STEREO LED |
| STEREO [H] | STEREO Ⓗ |
| STEREO [L] | STEREO Ⓛ |
| STOP. PO | STOP POSITION |
| STOP/5V | STOP POSITION/5V |
| STOP1/TAPE SEL | STOP1 POSITION/TAPE SELECT |
| STOP1/PAL:ST | STOP1 POSITION/PAL |
| STOP2. PO | STOP 2 POSITION |
| STOP2/S-TAB | STOP 2 POSITION/SAFETY TAB SW |
| STREO [H] | STEREO Ⓗ |
| SUB BIAS | SUB BIAS |
| SUB. SW | SUB SW |
| SVHS CAS [L] | S-VHS CASSETTE Ⓛ |
| SW. 5. DET | SW 5V DETECT |
| SYNC [L] | SYNC Ⓛ |

| | |
|---|---|
| SYSCON 5V | SYSTEM CONTROL 5V |
| SYSTEM | SYSTEM SW |
| T-PHOTO | TAKE-UP PHOTO TRANSISTOR |
| T-RL. PLS | TAKE-UP REEL PULSE |
| T. BUSCLK | TIMER BUS CLOCK |
| T. BUSLSN | TIMER BUS LISTEN |
| T. BUSTLK | TIMER BUS TALK |
| T. END [L] | TAPE END Ⓛ |
| T. PHOTO | TAKE-UP PHOTO TRANSISTOR |
| TAPE END [L] | TAPE END Ⓛ |
| TAPE END [L]/CAM | TAPE END Ⓛ/CAMERA PAUSE |
| TEST | TEST MODE |
| TPZ | TRAPEZOIDAL WAVE CIRCUIT |
| TRIC [L] | TRIC PLAY Ⓛ |
| TRICK [L] | TRIC PLAY Ⓛ |
| TRK. ENV | AUTO TRACKING ENVELOPE DETECT |
| TU. AUDIO | TUNER AUDIO |
| TU. GND | TUNER GND |
| TU. V. IN | TUNER VIDEO SIGNAL INPUT |
| TU. VIDEO | TUNER VIDEO |
| TUN NOR IN | TUNER NORMAL INPUT |
| TUN R | TUNER AUDIO (R) |
| TUN. AUDIO IN | TUNER AUDIO INPUT |
| TUNER 12V | TUNER 12V |
| TUNER L | TUNER AUDIO (L) |
| TUNER V IN | TUNER VIDEO SIGNAL INPUT |
| TUNER [L] | TUNER AUDIO (L) |
| TUNER [N] | TUNER AUDIO (NORMAL) |
| TUNER [R] | TUNER AUDIO (R) |
| TUNER. 12 | TUNER 12V |
| TUOFF [H] | TUNER OFF Ⓗ |
| TV. AUDIO | TV AUDIO |
| TV/VTR | TV/VTR |
| TXTON [L] | TEXT ON Ⓛ |
| U. REG45V | UNREGULATOR 45V |
| UNREG | UNREGULATOR |
| UNREG19V | UNREGULATOR 19V |
| V. REF | REFERENCE VOLTAGE |
| V. EE [H] | VIDEO EE Ⓗ |
| V. EE [L] | VIDEO EE Ⓛ |
| VCO REF | REFERENCE OSCILLATER |
| VD. IN | VIDEO SIGNAL INPUT |
| VD. OUT | VIDEO SIGNAL OUTPUT |
| VIDEO EE [L] | VIDEO EE Ⓛ |
| VIDEO IN | VIDEO SIGNAL INPUT |
| VIDEO OUT | VIDEO SIGNAL OUTPUT |
| VM | MOTOR VOLTAGE |
| VM DOWN [L] | MOTOR VOLTAGE DOWN Ⓛ |
| VSS | VERTICAL SYNC SIGNAL |
| VTR [H] | VTR Ⓗ |
| VTR. 12V | VTR 12V |
| X IN | OSCILLATOR INPUT |
| X OUT | OSCILLATOR OUTPUT |

# 6 INPUT/OUTPUT CHART

## 6.1. INPUT/OUTPUT CHART FOR IC6001

<table>
<tr><th>Pin No.</th><th>In/Out</th><th>Port Name</th><th>Function</th></tr>
<tr><td>1</td><td>O</td><td>AUDIO DEF(H)</td><td>This port is low while Decoder IC is reset.</td></tr>
<tr><td>2</td><td>O</td><td>V.EE2 (L)</td><td>Terminal for EE/VV switching. (Timing/logic are same as "pin 24".)</td></tr>
<tr><td>3</td><td>I</td><td>AFC(S)</td><td>Tuner S curve input.</td></tr>
<tr><td>4</td><td>O</td><td>Not used</td><td>Not used</td></tr>
<tr><td>5</td><td>I</td><td>L6/U6/U4/U2/U2L</td><td>Cylinder unit (HI-FI/Normal) selection.
<table>
<tr><th>Input voltage</th><th>Cylinder Type</th><th>HI-FI/NORMAL</th></tr>
<tr><td>More than 4.2V</td><td>LDD 6CH</td><td>HI-FI</td></tr>
<tr><td>3.0V - 4.2V</td><td>UDD 6CH</td><td>HI-FI</td></tr>
<tr><td>2.0V - 3.0V</td><td>UDD 2CH<br>(No LP mode)</td><td>NORMAL</td></tr>
<tr><td>0.8V - 2.0V</td><td>UDD 2CH<br>(With LP mode)</td><td>NORMAL</td></tr>
<tr><td>Less than 0.8V</td><td>UDD 4CH</td><td>NORMAL</td></tr>
</table></td></tr>
<tr><td>6</td><td>I</td><td>NORM/SER/T1/T2</td><td>Normal/Service/Test1/Test2 mode selection.
<table>
<tr><th>Input voltage</th><th>Mode</th></tr>
<tr><td>More than 4.0V</td><td>Normal</td></tr>
<tr><td>2.5V - 4.0V</td><td>Service</td></tr>
<tr><td>1.0V - 2.5V</td><td>Test2</td></tr>
<tr><td>Less than 1.0V</td><td>Test1</td></tr>
</table></td></tr>
<tr><td>7</td><td>I</td><td>S-PHOT</td><td>This port receives 2.4V or less when Supply photo sensor detects the tape end.</td></tr>
<tr><td>8</td><td>I</td><td>T-PHOT</td><td>This port receives 2.4V or less when Take-up photo sensor detects the tape beginning.</td></tr>
<tr><td>9</td><td>I</td><td>TRACKING ENVE</td><td>Playback envelope input for auto tracking adjustment and CVC.</td></tr>
<tr><td>10</td><td>O</td><td>Not used</td><td>Not used</td></tr>
<tr><td>11</td><td>O</td><td>CURRENT LIMIT</td><td>Capstan motor current limitter output.</td></tr>
<tr><td>12</td><td>O</td><td>F. ADJUST</td><td>Frequency responsibility adjustment voltage output.</td></tr>
<tr><td>13</td><td>O</td><td>ART.V/H/N</td><td>This port supplies artificial vertical sync signal to stabilize the picture in special playback mode.</td></tr>
<tr><td>14</td><td>I</td><td>REMOCON</td><td>Remote control signal input and Digital Link input.</td></tr>
<tr><td>15</td><td>O</td><td>ROTARY.SW</td><td>Rotary switching signal output.</td></tr>
<tr><td>16</td><td>O</td><td>H.A.SW</td><td>Head amp switching signal output.</td></tr>
<tr><td>17</td><td>I</td><td>ENVE.SLECT</td><td>This port receives the playback envelope signal level to select the video head in special playback mode.</td></tr>
<tr><td>18</td><td>O</td><td>VIDEO.H.SW</td><td>Video head switching signal output.</td></tr>
<tr><td>19</td><td>O</td><td>AUDIO.H.SW</td><td>Audio head switching signal output.</td></tr>
<tr><td>20</td><td>O</td><td>Not used</td><td>Not used</td></tr>
<tr><td>21</td><td>O</td><td>D.REC(H)</td><td>Video signal recording on/off control.</td></tr>
<tr><td>22</td><td>O</td><td>C.EMPHA(H)</td><td>This port supplies high during a certain time from starting the recording to control the HI-FI audio recording current.</td></tr>
<tr><td>23</td><td>O</td><td>D.FM.MUTE (H)</td><td>HI-FI audio recording on/off control.</td></tr>
<tr><td>24</td><td>O</td><td>VIDEO.EE(L)</td><td>This port is low during EE mode.</td></tr>
<tr><td>25</td><td>O</td><td>PLAY REC (L)</td><td>Capstan voltage switching control output.<br>Except Play/Rec:High<br>Play/Rec:Low (Jog/Shuttle mode in Playback:High)</td></tr>
</table>

Fig. MP1

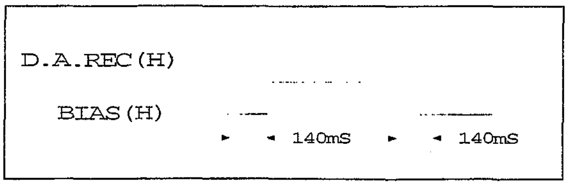
<table>
<tr><th>Pin No.</th><th>In/Out</th><th>Port Name</th><th>Function</th></tr>
<tr><td>26</td><td>O</td><td>D.A.REC(H)</td><td rowspan="2">DC voltage control for recording mode.<br> </td></tr>
<tr><td>27</td><td>O</td><td>BIAS(H)</td></tr>
<tr><td>28</td><td>O</td><td>FM.MUTE(H)</td><td>This port is high during special playback (CUE,REV,SLOW,STILL) mode, head cleaning and so on.</td></tr>
<tr><td>29</td><td>O</td><td>VSYNC(L)</td><td>This port is low when detecting the V-Sync signal.</td></tr>
<tr><td>30</td><td>O</td><td>FULL.ERASE(H)</td><td>Full erase on/off control.<br>ON : High<br>OFF : Low</td></tr>
<tr><td>31</td><td>I</td><td>POS.SW3</td><td rowspan="3">
<table>
<tr><th>P. SW 3</th><th>P. SW 2</th><th>P. SW 1</th><th>Position (Mode) Name</th></tr>
<tr><td>O</td><td>O</td><td>O</td><td>EJECT</td></tr>
<tr><td>O</td><td>O</td><td>I</td><td>CASSETTE DOWN</td></tr>
<tr><td>O</td><td>I</td><td>O</td><td>REV,REV SLOW</td></tr>
<tr><td>O</td><td>I</td><td>I</td><td>MID (LOADING/UNLOADING)</td></tr>
<tr><td rowspan="2">I</td><td rowspan="2">O</td><td rowspan="2">O</td><td>PLAY/REC,STILL/PAUSE,CUE</td></tr>
<tr><td>FWD SLOW,STOP3*1</td></tr>
<tr><td>I</td><td>O</td><td>I</td><td>STOP</td></tr>
<tr><td>I</td><td>I</td><td>O</td><td>FF/REW</td></tr>
<tr><td>I</td><td>I</td><td>I</td><td>INTERMEDIATE</td></tr>
</table>
(*1) The Pinch Roller is on the Capstan motor shaft.</td></tr>
<tr><td>32</td><td>I</td><td>POS.SW2</td></tr>
<tr><td>33</td><td>I</td><td>POS.SW1</td></tr>
<tr><td>34</td><td>I</td><td>GND</td><td>GND.</td></tr>
<tr><td>35</td><td>I</td><td>GND</td><td>GND.</td></tr>
<tr><td>36</td><td>O</td><td>16M.START(H)</td><td>Control signal of 16 MHz Oscillator.</td></tr>
<tr><td>37</td><td>-</td><td>5V(D)</td><td>Digital 5V.</td></tr>
<tr><td>38</td><td>I</td><td>16MHz.IN</td><td>Oscillator input.</td></tr>
<tr><td>39</td><td>O</td><td>16MHz.OUT</td><td>Oscillator output.</td></tr>
<tr><td>40</td><td>-</td><td>GND(OSC)</td><td>Oscillator GND.</td></tr>
<tr><td>41</td><td>I</td><td>32KHz.IN</td><td>Oscillator input.</td></tr>
<tr><td>42</td><td>O</td><td>32KHz.OUT</td><td>Oscillator output.</td></tr>
<tr><td>43</td><td>I</td><td>RESET(L)</td><td>Reset low input.</td></tr>
<tr><td>44</td><td>O</td><td>FIP(L)</td><td>FIP on/off control.</td></tr>
<tr><td>45</td><td>O</td><td>FIP/OSD CS</td><td>Chip Select terminal for FIP driver & OSD u-com.</td></tr>
<tr><td>46</td><td>O</td><td>CAL(H)</td><td>Auto-adjustment of Audio IC is in progress, this terminal goes to hight.</td></tr>
<tr><td>47</td><td>I</td><td>POWER KEY (H)</td><td>Power on/off key input.</td></tr>
<tr><td>48</td><td>I</td><td>STAB (L)</td><td>This port receives low when inserting the cassette tape with safety tab.</td></tr>
</table>

Fig. MP2

| Pin No. | In/Out | Port Name | Function |
|---|---|---|---|
| 49 | O | AI MES(H) | AI REC mesurement is in progresss, this terminal goes to high. |
| 50 | O | HALF WAVE(H) | Capstan driver selection. |
| 51 | O | P.OFF(H) | Power off high output. |
| 52 | O | EX. FF/REW (L) | This port supplies low during except FF and REW modes. |
| 53 | O | Not used | This terminal keeps Low signal. |
| 54 | O | Not used | This terminal keeps Low signal. |
| 55 | O | UNLOADING(H) | This port supplies high during the mechanism is unloaded. |
| 56 | O | LOADING(H) | This port supplies high during the mechanism is loaded. |
| 57 | O | LP (H) | Tape speed output. |
| 58 | O | SLEEP(L) | Super power save mode setting terminal. |
| 59 | O | PAL-I/BG/DK | System 4<br>I/L: High<br>D/K: Impedance<br>B/G: Low |
| 60 | O | SECAM/PAL | System 2<br>SECAM: Low<br>OTHERS: High |
| 61 | O | NTSC(L) | System 5<br>60 Hz: Low<br>50 Hz: High |
| 62 | O | YMO | This terminal keeps Low signal. |
| 63 | O | Not used | This terminal keeps Low signal. |
| 64 | O | Not used | This terminal keeps Low signal. |
| 65 | O | T2.DATA.OUT | EDIT 5pin data output factory. |
| 66 | I | T2.DATA.IN | EDIT 6pin data clock output for factory. |
| 67 | O | T2.CLOCK | EDIT 7pin data input for factory. |
| 68 | O | T-BUS/IC.OUT | The Serial data output for OSD microprocessor and FIP driver. |
| 69 | I | T-BUS/IC.IN | The Serial data input for OSD microprocessor and FIP driver. |
| 70 | O | T-BUS/IC.CLK | The Serial clock output for OSD microprocessor and FIP driver. |
| 71 | O | IIC.CLOCK | Tuner and HI-FI audio IC serial clock output. |
| 72 | I/O | IIC.DATA | Tuner and HI-FI audio IC serial data input/output. |
| 73 | O | 125Hz | Oscillator output for main clock adjustment. |
| 74 | O | Not used | This terminal keeps Low signal. |
| 75 | I | POWER FAIL(L) | Power failure detection. |
| 76 | O | CAP.R/F | Capstan rotation direction control.<br>Reverse : High<br>Forward : Low |
| 77 | O | CAP.ET | Capstan torque control. |
| 78 | O | CYL.ET | Cylinder torque control. |
| 79 | I | S.REEL.PULSE | Supply reel pulse input. |
| 80 | I | T.REEL.PULSE | Take-up reel pulse input. |
| 81 | I | Not used | Not used |

Fig. MP3

| Pin No. | In/Out | Port Name | Function |
|---|---|---|---|
| 82 | O | Not used | Not used |
| 83 | I | SHORT DN | DC voltage (BIAS (H)) detection.<br>When detecting High at BIAS (H) during BIAS (H) is set to except high, complsory power is turned off (Self test indication display F08).<br>When detecting Low at BIAS (H) during BAIS (H) is set to high, complsory power is turned off (Self test indication display F07). |
| 84 | I | C. SYNC | Composite sync signal input. |
| 85 | I | CAP.FG | Capstan FG input. |
| 86 | I | CYL.PFG | Cylinder PFG input. |
| 87 | I | SECAM24(H) | Video head selection input.<br>In SECAM model, this port is high when using 24u head chip for LP mode is mounted on the cylinder. |
| 88 | - | GND | GND. |
| 89 | O | OREF | Op amp output for 1/2 VDD reference. |
| 90 | I | IREF | Op amp input for 1/2 VDD reference. |
| 91 | I | CTL.HEAD(-) | Control signal (-) input. |
| 92 | I | CTL.HEAD(+) | Control signal (+) input. |
| 93 | O | CTL.AMP.SW | Control amp switching output. |
| 94 | I | CTL.AMP.IN | Control amp input. |
| 95 | I | CTL.AMP.REF | Control amp reference input. |
| 96 | - | CTL.AMP.GND | Control amp GND. |
| 97 | O | PB.CTL.OUT | Playback Control signal output. |
| 98 | - | 5V(A) | Analog 5V. |
| 99 | - | 5V(AD) | 5V. |
| 100 | O | Not used | This terminal Low signal. |

Fig. MP4

## 6.2. TRUTH TABLE

| INPUT CONDITION | | | | | | | OUTPUT RESULT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POWER | AV2 SELECT | TV/ VTR | EE/ VV | OSD ON(H) | INPUT CH | AV2 PB(H) | AV1 OUT | AV2 OUT | AV1 PB(H) | RGB SW | VCR IN | VCR OUT |
| P.OFF | --- | --- | --- | --- | --- | L | AV2 IN | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| VPS STAND BY | EXT | --- | --- | L | NORMAL TUN | L | AV2 IN | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| | | | | | C+ TUNER | L | AV2 IN | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| | | | | | AV1 | L | AV2 IN | AV1 IN | L | OFF | AV1 | AV1 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV1 | AV1 |
| | | | | | AV2 | L | AV2 IN | AV1 IN | L | OFF | AV2 | AV2 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | AV2 IN | AV1 IN | L | OFF | AV3 | AV3 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | AV2 IN | AV1 IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | AV2 IN | AV1 IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | SAT.TUN | SAT.TUN |
| | | | | H | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | DECODER | --- | --- | L | NORMAL TUN | L | AV2 IN | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| | | | | | C+ TUNER | L | AV2 IN | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| | | | | | AV1 | L | AV2 IN | AV1 IN | L | OFF | AV1 | AV1 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | AV2 IN | AV1 IN | L | OFF | AV2 | AV2 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | AV2 IN | AV1 IN | L | OFF | AV3 | AV3 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | AV2 IN | AV1 IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | AV2 IN | AV1 IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | SAT.TUN | SAT.TUN |
| | | | | H | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |

| INPUT CONDITION | | | | | | | OUTPUT RESULT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POWER | AV2 SELECT | TV/ VTR | EE/ VV | OSD ON(H) | INPUT CH | AV2 PB(H) | AV1 OUT | AV2 OUT | AV1 PB(H) | RGB SW | VCR IN | VCR OUT |
| P.ON | EXT | TV | EE | L | NORMAL TUN | --- | VTR OUT | VTR OUT | L | OFF | TUN | TUN |
| | | | | | C+ TUNER | --- | VTR OUT | VTR OUT | L | OFF | TUN | TUN |
| | | | | | AV1 | --- | VTR OUT | VTR OUT | L | OFF | AV1 | AV1 |
| | | | | | AV2 | --- | VTR OUT | VTR OUT | L | ON | AV2 | AV2 |
| | | | | | AV3 | --- | VTR OUT | VTR OUT | L | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | --- | VTR OUT | VTR OUT | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | --- | VTR OUT | VTR OUT | L | OFF | SAT.TUN | SAT.TUN |
| | | | | H | NORMAL TUN | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | AV1 | --- | VTR OUT | VTR OUT | H | OFF | AV1 | AV1 |
| | | | | | AV2 | --- | VTR OUT | VTR OUT | H | ON | AV2 | AV2 |
| | | | | | AV3 | --- | VTR OUT | VTR OUT | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | VTR | EE | L | NORMAL TUN | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | AV1 | --- | VTR OUT | VTR OUT | H | OFF | AV1 | AV1 |
| | | | | | AV2 | --- | VTR OUT | VTR OUT | H | ON | AV2 | AV2 |
| | | | | | AV3 | --- | VTR OUT | VTR OUT | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | | | H | NORMAL TUN | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | --- | VTR OUT | VTR OUT | H | OFF | TUN | TUN |
| | | | | | AV1 | --- | VTR OUT | VTR OUT | H | OFF | AV1 | AV1 |
| | | | | | AV2 | --- | VTR OUT | VTR OUT | H | ON | AV2 | AV2 |
| | | | | | AV3 | --- | VTR OUT | VTR OUT | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | SAT.TUN |
| | | | VV | --- | NORMAL TUN | --- | VTR OUT | VTR OUT | H | OFF | TUN | PB |
| | | | | | C+ TUNER | --- | VTR OUT | VTR OUT | H | OFF | TUN | PB |
| | | | | | AV1 | --- | VTR OUT | VTR OUT | H | OFF | AV1 | PB |
| | | | | | AV2 | --- | VTR OUT | VTR OUT | H | OFF | AV2 | PB |
| | | | | | AV3 | --- | VTR OUT | VTR OUT | H | OFF | AV3 | PB |
| | | | | | SAT.NOR TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | PB |
| | | | | | SAT.C+ TUN | --- | VTR OUT | VTR OUT | H | OFF | SAT.TUN | PB |
| | DECODER | TV | EE | L | NORMAL TUN | L | VTR OUT | AV1 IN | L | OFF | TUN | TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | TUN IN | L | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | TUN IN | L | OFF | AV2 | AV2 |
| | | | | | AV1 | L | VTR OUT | AV1 IN | L | OFF | AV1 | AV1 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | L | ON | AV2 | AV2 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | VTR OUT | AV1 IN | L | OFF | AV3 | AV3 |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | AV2 IN | AV1 IN | H | ON | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | SAT IN | L | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | SAT IN | L | OFF | AV2 | AV2 |
| | | | | H | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | TUN IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | TUN IN | H | ON | AV2 | AV2 |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |

| INPUT CONDITION | | | | | | | OUTPUT RESULT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POWER | AV2 SELECT | TV/ VTR | EE/ VV | OSD ON(H) | INPUT CH | AV2 PB(H) | AV1 OUT | AV2 OUT | AV1 PB(H) | RGB SW | VCR IN | VCR OUT |
| P.ON | DECODER | TV | EE | H | AV3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | SAT IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | SAT IN | H | ON | AV2 | AV2 |
| | | VTR | EE | L | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | TUN IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | TUN IN | H | ON | AV2 | AV2 |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV 3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | SAT IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | SAT IN | H | ON | AV2 | AV2 |
| | | | | H | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | TUN |
| | | | | | C+ TUNER | L | VTR OUT | TUN IN | H | OFF | TUN | TUN |
| | | | | | | H | VTR OUT | TUN IN | H | ON | AV2 | AV2 |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | AV1 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | | H | VTR OUT | AV1 IN | H | ON | AV2 | AV2 |
| | | | | | AV3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | AV3 |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | SAT.C+ TUN | L | VTR OUT | SAT IN | H | OFF | SAT.TUN | SAT.TUN |
| | | | | | | H | VTR OUT | SAT IN | H | ON | AV2 | AV2 |
| | | | VV | --- | NORMAL TUN | L | VTR OUT | AV1 IN | H | OFF | TUN | PB |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | TUN | PB |
| | | | | | C+ TUNER | L | VTR OUT | TUN IN | H | OFF | TUN | PB |
| | | | | | | H | VTR OUT | TUN IN | H | OFF | AV2 | PB |
| | | | | | AV1 | L | VTR OUT | AV1 IN | H | OFF | AV1 | PB |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV2 | PB |
| | | | | | AV2 | L | VTR OUT | AV1 IN | H | OFF | AV2 | PB |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV2 | PB |
| | | | | | AV3 | L | VTR OUT | AV1 IN | H | OFF | AV3 | PB |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | AV3 | PB |
| | | | | | SAT.NOR TUN | L | VTR OUT | AV1 IN | H | OFF | SAT.TUN | PB |
| | | | | | | H | VTR OUT | AV1 IN | H | OFF | SAT.TUN | PB |
| | | | | | SAT.C+ TUN | L | VTR OUT | SAT IN | H | OFF | SAT.TUN | PB |
| | | | | | | H | VTR OUT | SAT IN | H | OFF | AV2 | PB |

# 7 WAVEFORM TABLE

| | | | | |
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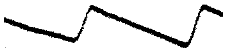
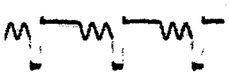
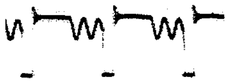
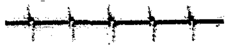
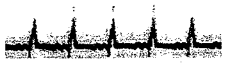
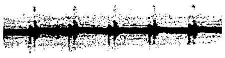
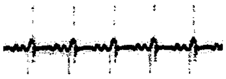
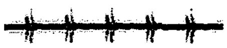
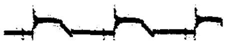
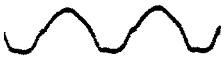
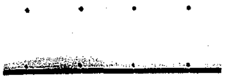
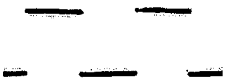
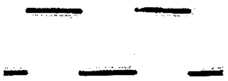
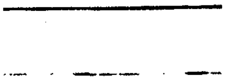
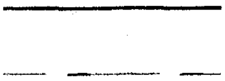
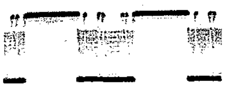
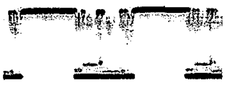
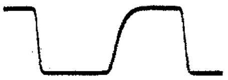
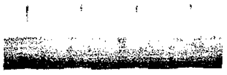
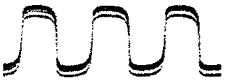
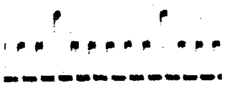
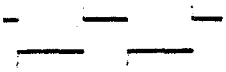
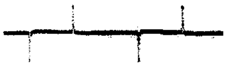
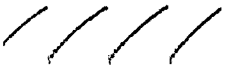
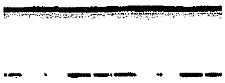
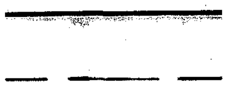
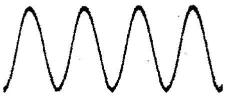
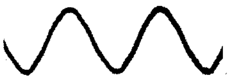
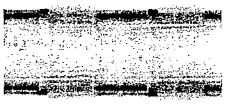
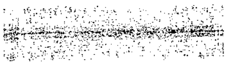
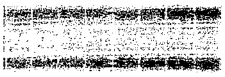
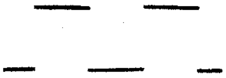
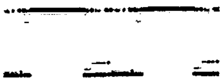
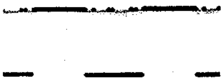
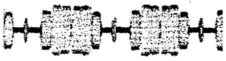
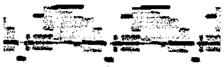
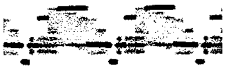
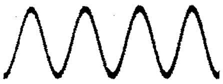
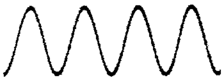
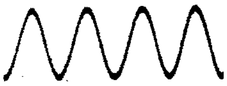
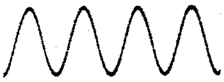
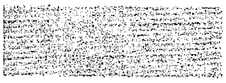
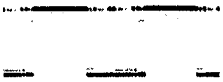
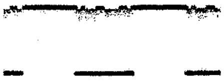
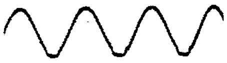
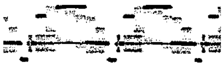
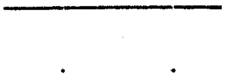
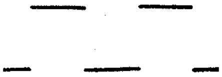
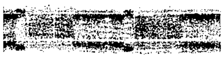
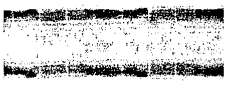
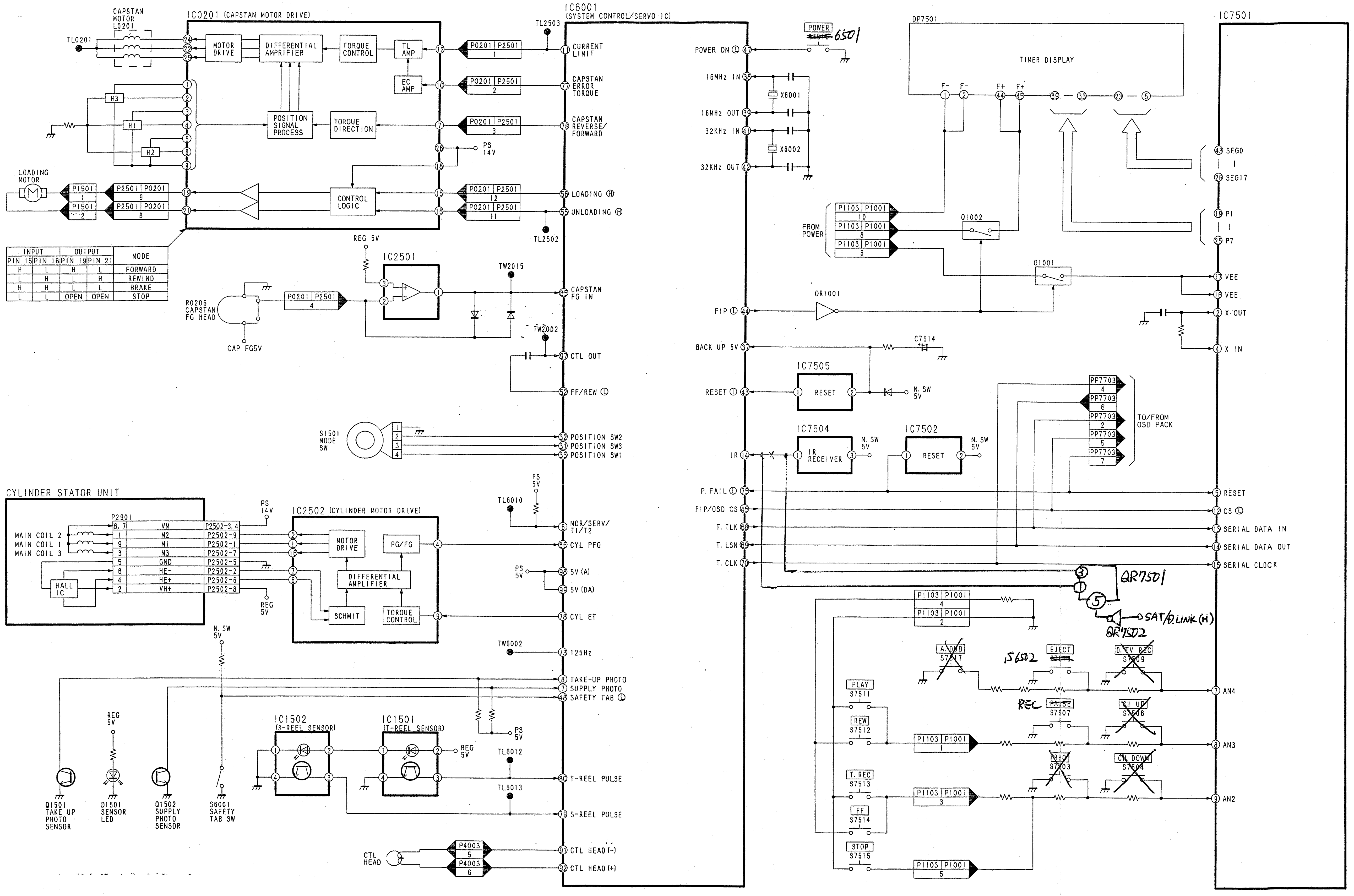
| <br>T1101-3 STOP<br>8.0Vp-p (2msec. div.) | <br>T1101-7 STOP<br>100Vp-p (5μsec. div.) | <br>IC1101-1 STOP<br>500Vp-p (5μsec. div.) | <br>IC1101-2 STOP<br>11Vp-p (10μsec. div.) | <br>IC1101-4 STOP<br>0.8Vp-p (10μsec. div.) |
| <br>IC1101-5 STOP<br>1.4Vp-p (10μsec. div.) | <br>IC1101-6 STOP<br>4.0Vp-p (10μsec. div.) | <br>IC1101-7 STOP<br>0.6Vp-p (10μsec. div.) | <br>Q1111-1 STOP<br>0.5Vp-p (5μsec. div.) | <br>IC2502-1,2,16 REC<br>9.0Vp-p (2msec. div.) |
| <br>IC6001-13 PAUSE<br>4.8Vp-p (10msec. div.) | <br>IC6001-15 REC<br>4.8Vp-p (10msec. div.) | <br>IC6001-18 REC<br>5.0Vp-p (10msec. div.) | <br>IC6001-68,69 REC<br>5.0Vp-p (5msec. div.) | <br>IC6001-70 REC<br>5.0Vp-p (5msec. div.) |
| <br>IC6001-71 REC<br>5.0Vp-p (5msec. div.) | <br>IC6001-72 REC<br>5.0Vp-p (5msec. div.) | <br>IC6001-79,80 FF/REW<br>5.0Vp-p (1msec. div.) | <br>IC6001-84 REC<br>5.0Vp-p (10msec. div.) | <br>IC6001-85 REC<br>0.8Vp-p (5msec. div.) |
| <br>IC6001-86 REC<br>5.0Vp-p (10msec. div.) | <br>IC6001-91,92 REC<br>6.0Vp-p (10msec. div.) | <br>IC6001-97 PLAY<br>4.2Vp-p (10msec. div.) | <br>IC7501-4 STOP<br>2.2Vp-p (0.2μsec. div.) | <br>IC7501-13,14 STOP<br>5.0Vp-p (5msec. div.) |
| <br>IC7501-15 STOP<br>5.0Vp-p (5msec. div.) | <br>IC3001-2 REC<br>1.5Vp-p (5msec. div.) | <br>IC3001-4 PLAY<br>5.0Vp-p (5msec. div.) | <br>IC3001-14 REC<br>0.4Vp-p (5msec. div.) | <br>IC3001-15 PLAY<br>0.6Vp-p (20μsec. div.) |

| | | | | |
|---|---|---|---|---|
| <br>IC3001-20 PLAY<br>150mVp-p<br>(20µsec. div.) | <br>IC3001-24 REC/PLAY<br>5.0Vp-p (10msec. div.) | <br>IC3001-37 REC/PLAY<br>5.0Vp-p (5msec. div.) | <br>IC3001-38 REC/PLAY<br>5.0Vp-p (5msec. div.) | <br>IC3001-42,43 PLAY<br>0.4Vp-p (20µsec. div.) |
| <br>IC3001-48,50 REC<br>1.0Vp-p (20µsec. div.) | <br>IC3001-52 REC/PLAY<br>2.0Vp-p (20µsec. div.) | <br>IC4501-6,7 REC<br>1.2Vp-p (5msec. div.) | <br>IC4501-16,17<br>REC/PLAY<br>1.2Vp-p (5msec. div.) | <br>IC4501-21 REC<br>1.2Vp-p (5msec. div.) |
| <br>IC4501-22 REC/PLAY<br>1.2Vp-p (5msec. div.) | <br>IC4501-36 REC<br>3.5Vp-p (20µsec. div.) | <br>IC4501-42 REC/PLAY<br>5.0Vp-p (5msec. div.) | <br>IC4501-43 REC/PLAY<br>5.0Vp-p (5msec. div.) | <br>Q4005-C REC<br>Q4007-C REC<br>9.0Vp-p (5µsec. div.) |
| <br>PP7701-5,7 REC/PLAY<br>2.0Vp-p (20µsec. div.) | <br>PP7703-13,14<br>REC/PLAY<br>5.0Vp-p (10msec. div.) | <br>IC3501-1 REC/PLAY<br>5.0Vp-p (10msec. div.) | <br>IC3501-30 PLAY<br>0.4Vp-p (5msec. div.) | <br>IC3501-31 REC<br>0.3Vp-p (5msec. div.) |

# 8 BLOCK DIAGRAMS

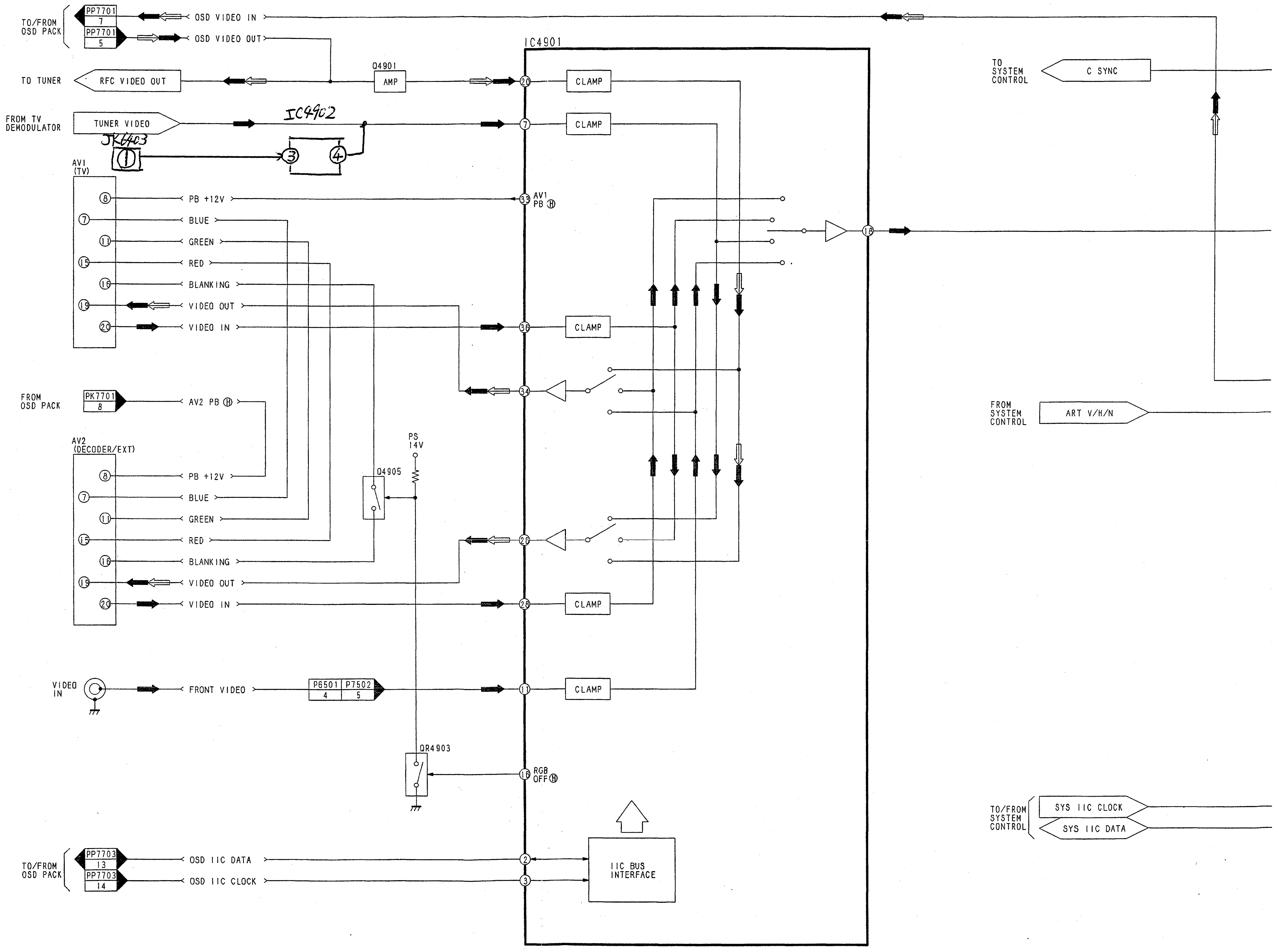
## 8.1. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

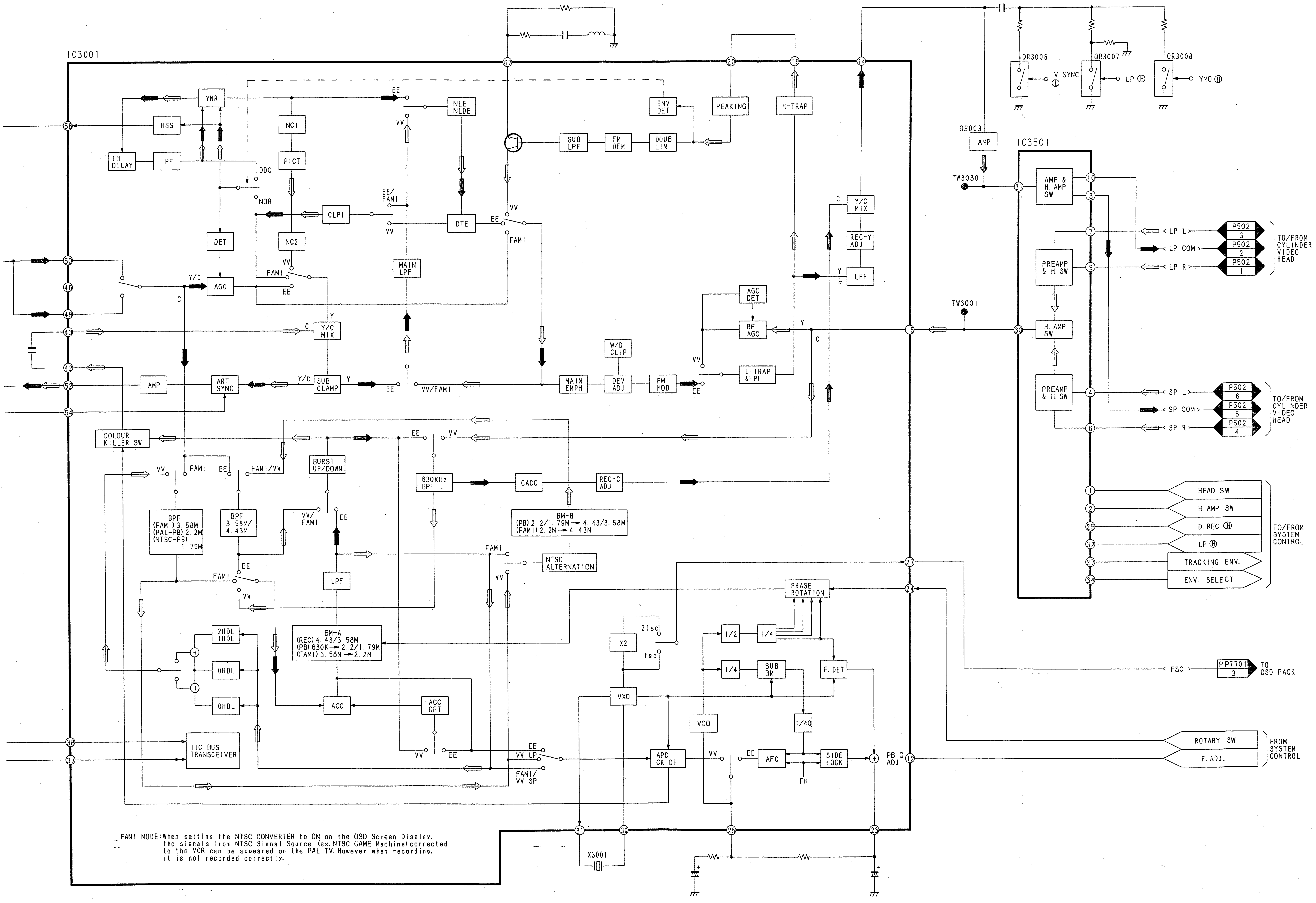

CAPSTAN MOTOR L0201
TL0201
IC0201 (CAPSTAN MOTOR DRIVE)
MOTOR DRIVE
DIFFERENTIAL AMPRIFIER
TORQUE CONTROL
TL AMP
EC AMP
POSITION SIGNAL PROCESS
TORQUE DIRECTION
CONTROL LOGIC
H1
H2
H3
PS 14V
LOADING MOTOR
P1501 1
P1501 2
P2501 P0201 9
P2501 P0201 8
P0201 P2501 1
P0201 P2501 2
P0201 P2501 3
P0201 P2501 12
P0201 P2501 11
P0201 P2501 4
TL2503
TL2502
IC6001 (SYSTEM CONTROL/SERVO IC)
CURRENT LIMIT
CAPSTAN ERROR TORQUE
CAPSTAN REVERSE/ FORWARD
LOADING Ⓗ
UNLOADING Ⓗ
REG 5V
IC2501
TW2015
TW2002
R0206 CAPSTAN FG HEAD
CAP FG5V
CAPSTAN FG IN
CTL OUT
FF/REW Ⓛ
S1501 MODE SW
POSITION SW2
POSITION SW3
POSITION SW1
CYLINDER STATOR UNIT
P2901
MAIN COIL 2
MAIN COIL 1
MAIN COIL 3
HALL IC
VM
M2
M1
M3
GND
HE-
HE+
VH+
P2502-3, 4
P2502-9
P2502-1
P2502-7
P2502-5
P2502-2
P2502-6
P2502-8
PS 14V
REG 5V
IC2502 (CYLINDER MOTOR DRIVE)
MOTOR DRIVE
PG/FG
DIFFERENTIAL AMPLIFIER
SCHMIT
TORQUE CONTROL
PS 5V
TL6010
NOR/SERV/ TI/T2
CYL PFG
5V (A)
5V (DA)
CYL ET
TW6002
125Hz
N. SW 5V
TAKE-UP PHOTO
SUPPLY PHOTO
SAFETY TAB Ⓛ
REG 5V
IC1502 (S-REEL SENSOR)
IC1501 (T-REEL SENSOR)
PS 5V
TL6012
TL6013
T-REEL PULSE
S-REEL PULSE
Q1501 TAKE UP PHOTO SENSOR
D1501 SENSOR LED
Q1502 SUPPLY PHOTO SENSOR
S6001 SAFETY TAB SW
CTL HEAD
P4003 5
P4003 6
CTL HEAD (-)
CTL HEAD (+)
POWER
~~S6510~~ 6501
POWER ON Ⓛ
16MHz IN
X6001
16MHz OUT
32KHz IN
X6002
32KHz OUT
DP7501
TIMER DISPLAY
F-
F-
F+
F+
IC7501
SEG0
SEG17
P1
P7
FROM POWER
P1103 P1001 10
P1103 P1001 8
P1103 P1001 6
Q1002
Q1001
VEE
VEE
QR1001
FIP Ⓛ
X OUT
X IN
C7514
BACK UP 5V
IC7505
RESET
RESET Ⓛ
N. SW 5V
PP7703 4
PP7703 6
PP7703 2
PP7703 5
PP7703 7
TO/FROM OSD PACK
IC7504
IR RECEIVER
IC7502
RESET
IR Ⓛ
P. FAIL Ⓛ
FIP/OSD CS
T. TLK
T. LSN
T. CLK
RESET
CS Ⓛ
SERIAL DATA IN
SERIAL DATA OUT
SERIAL CLOCK
QR7501
SAT/D.LINK(H)
QR7502
P1103 P1001 4
P1103 P1001 2
P1103 P1001 1
P1103 P1001 3
P1103 P1001 5
A.DUB S7517
S6502
EJECT ~~S7510~~
D.TV REC S7509
PLAY S7511
REC
PAUSE S7507
CH UP S7506
REW S7512
REC S7503
CH DOWN S7504
T. REC S7513
FF S7514
STOP S7515
AN4
AN3
AN2

| INPUT | | OUTPUT | | MODE |
|---|---|---|---|---|
| PIN 15 | PIN 16 | PIN 19 | PIN 21 | |
| H | L | H | L | FORWARD |
| L | H | L | H | REWIND |
| H | H | L | L | BRAKE |
| L | L | OPEN | OPEN | STOP |

## 8.2. LUMINANCE & CHROMINANCE BLOCK DIAGRAM

⬅ MAIN SIGNAL PATH IN REC MODE ⇐ MAIN SIGNAL PATH IN PLAYBACK MODE

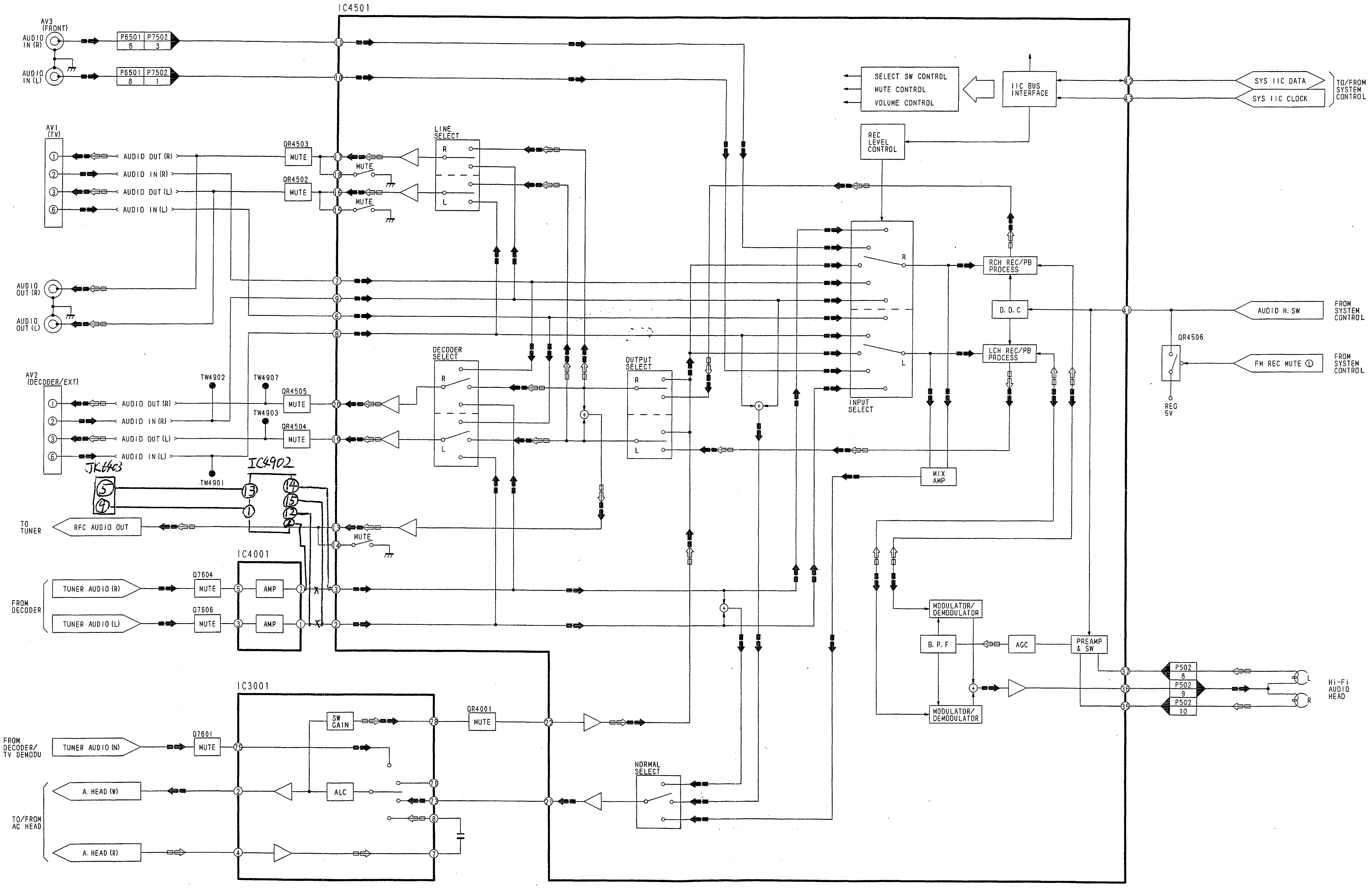

TO/FROM OSD PACK
PP7701 7
PP7701 5
OSD VIDEO IN
OSD VIDEO OUT
TO TUNER
RFC VIDEO OUT
Q4901
AMP
IC4901
CLAMP
FROM TV DEMODULATOR
TUNER VIDEO
IC4902
JK6403
①
③
④
AV1 (TV)
PB +12V
BLUE
GREEN
RED
BLANKING
VIDEO OUT
VIDEO IN
AV1 PB Ⓗ
FROM OSD PACK
PK7701 8
AV2 PB Ⓗ
AV2 (DECODER/EXT)
PS 14V
Q4905
FRONT VIDEO
VIDEO IN
P6501 4
P7502 5
QR4903
RGB OFF Ⓗ
TO/FROM OSD PACK
PP7703 13
PP7703 14
OSD IIC DATA
OSD IIC CLOCK
IIC BUS INTERFACE
TO SYSTEM CONTROL
C SYNC
FROM SYSTEM CONTROL
ART V/H/N
TO/FROM SYSTEM CONTROL
SYS IIC CLOCK
SYS IIC DATA


IC3001
YNR
HSS
1H DELAY
LPF
DDC
NOR
DET
AGC
Y/C
C
NC1
PICT
CLP1
NC2
FAMI
VV
EE
NLE NLDE
EE/FAMI
DTE
MAIN LPF
ENV DET
SUB LPF
FM DEM
DOUB LIM
PEAKING
H-TRAP
Y/C MIX
REC-Y ADJ
LPF
AGC DET
RF AGC
L-TRAP &HPF
W/D CLIP
DEV ADJ
FM MOD
MAIN EMPH
VV/FAMI
SUB CLAMP
ART SYNC
AMP
COLOUR KILLER SW
FAMI/VV
BURST UP/DOWN
630KHz BPF
CACC
REC-C ADJ
BM-B (PB) 2.2/1.79M→4.43/3.58M (FAMI) 2.2M→4.43M
BPF (FAMI) 3.58M (PAL-PB) 2.2M (NTSC-PB) 1.79M
BPF 3.58M/4.43M
VV/FAMI
NTSC ALTERNATION
BM-A (REC) 4.43/3.58M (PB) 630K→2.2/1.79M (FAMI) 3.58M→2.2M
2HDL 1HDL
0HDL
0HDL
ACC
ACC DET
IIC BUS TRANSCEIVER
FAMI/VV SP
VV LP
APC CK DET
X2
2fsc
fsc
VXO
VCO
1/2
1/4
1/4
SUB BM
PHASE ROTATION
F. DET
1/40
AFC
SIDE LOCK
FH
PB Q ADJ
X3001
56
50
46
48
43
42
52
54
38
37
67
20
19
14
15
27
24
12
31
30
25
23
Q3003
AMP
TW3030
TW3001
QR3006
V. SYNC Ⓛ
QR3007
LP Ⓗ
QR3008
YMO Ⓗ
IC3501
AMP & H. AMP SW
PREAMP & H. SW
H. AMP SW
PREAMP & H. SW
10
3
7
9
31
30
4
5
6
1
2
25
32
27
34
LP L
LP COM
LP R
P502 3
P502 2
P502 1
TO/FROM CYLINDER VIDEO HEAD
SP L
SP COM
SP R
P502 6
P502 5
P502 4
TO/FROM CYLINDER VIDEO HEAD
HEAD SW
H. AMP SW
D. REC Ⓗ
LP Ⓗ
TRACKING ENV.
ENV. SELECT
TO/FROM SYSTEM CONTROL
FSC
PP7701 3
TO OSD PACK
ROTARY SW
F. ADJ.
FROM SYSTEM CONTROL

FAMI MODE: When setting the NTSC CONVERTER to ON on the OSD Screen Display, the signals from NTSC Signal Source (ex. NTSC GAME Machine) connected to the VCR can be appeared on the PAL TV. However when recording, it is not recorded correctly.

## 8.3. AUDIO BLOCK DIAGRAM

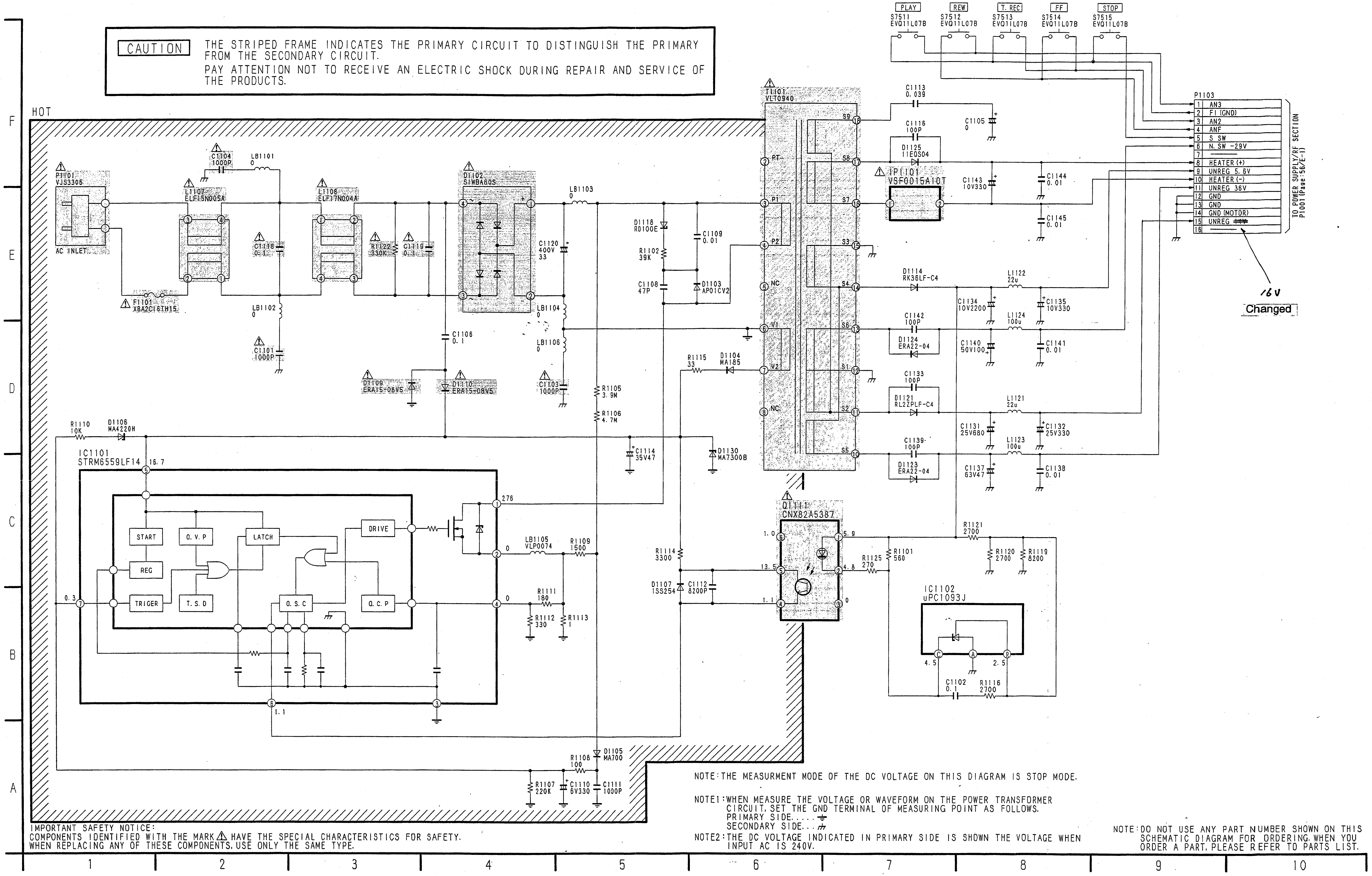
◀■■ MAIN SIGNAL PATH IN REC MODE ◁□□ MAIN SIGNAL PATH IN PLAYBACK MODE


IC4501
AV3 (FRONT)
AUDIO IN (R)
AUDIO IN (L)
P6501
P7502
6
3
8
1
AV1 (TV)
AUDIO OUT (R)
AUDIO IN (R)
AUDIO OUT (L)
AUDIO IN (L)
QR4503
QR4502
MUTE
LINE SELECT
R
L
AUDIO OUT (R)
AUDIO OUT (L)
SELECT SW CONTROL
MUTE CONTROL
VOLUME CONTROL
IIC BUS INTERFACE
SYS IIC DATA
SYS IIC CLOCK
TO/FROM SYSTEM CONTROL
REC LEVEL CONTROL
INPUT SELECT
RCH REC/PB PROCESS
LCH REC/PB PROCESS
D. O. C
AUDIO H. SW
FROM SYSTEM CONTROL
QR4506
FM REC MUTE ①
REG 5V
AV2 (DECODER/EXT)
TW4902
TW4907
TW4903
TW4901
QR4505
QR4504
DECODER SELECT
OUTPUT SELECT
JK4403
IC4902
TO TUNER
RFC AUDIO OUT
MIX AMP
IC4001
Q7604
Q7606
AMP
FROM DECODER
TUNER AUDIO (R)
TUNER AUDIO (L)
MODULATOR/ DEMODULATOR
B. P. F
AGC
PREAMP & SW
P502
Hi-Fi AUDIO HEAD
IC3001
SW GAIN
ALC
QR4001
Q7601
FROM DECODER/ TV DEMODU
TUNER AUDIO (N)
TO/FROM AC HEAD
A. HEAD (W)
A. HEAD (R)
NORMAL SELECT

# 9 SCHEMATIC DIAGRAMS

## 9.1. POWER SCHEMATIC DIAGRAM

CAUTION THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.


HOT
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
PLAY
REW
T. REC
FF
STOP
S7511 EVQ11L07B
S7512 EVQ11L07B
S7513 EVQ11L07B
S7514 EVQ11L07B
S7515 EVQ11L07B
P1101 VJS3306
AC INLET
F1101 XBA2C16TH15
C1104 1000P
LB1101 0
L1107 ELF15N005A
L1108 ELF17N004A
C1118 0.1
C1101 1000P
LB1102 0
R1122 330K
C1119 0.1
D1102 S1WBA60S
LB1103 0
C1120 400V 33
LB1104 0
LB1106 0
C1106 0.1
C1103 1000P
D1109 ERA15-08V5
D1110 ERA15-08V5
D1118 RD100E
R1102 39K
C1108 47P
C1109 0.01
D1103 AP01CV2
R1115 33
D1104 MA185
R1105 3.9M
R1106 4.7M
C1114 35V47
D1130 MA7300B
R1110 10K
D1106 MA4220H
IC1101 STRM6559LF14
16.7
START
O.V.P
LATCH
DRIVE
REG
TRIGER
T.S.D
O.S.C
O.C.P
0.3
276
LB1105 VLP0074
R1109 1500
R1111 180
R1112 330
R1113 1
1.1
R1108 100
D1105 MA700
R1107 220K
C1110 6V330
C1111 1000P
T1101 VLT0940
PT
P1
P2
NC
V1
V2
S9
S8
S7
S3
S4
S6
S1
S2
S5
C1113 0.039
C1116 100P
C1105 0
D1125 11EQS04
IP1101 VSF0015A10T
C1143 10V330
C1144 0.01
C1145 0.01
D1114 RK36LF-C4
L1122 22u
C1134 10V2200
C1135 10V330
C1142 100P
D1124 ERA22-04
L1124 100u
C1140 50V100
C1141 0.01
C1133 100P
D1121 RL2ZPLF-C4
L1121 22u
C1131 25V680
C1132 25V330
C1139 100P
L1123 100u
D1123 ERA22-04
C1137 63V47
C1138 0.01
Q1111 CNX82A5387
1.0
13.5
1.1
5.9
4.8
0
R1114 3300
D1107 1SS254
C1112 8200P
R1125 270
R1101 560
R1121 2700
R1120 2700
R1119 8200
IC1102 uPC1093J
4.5
2.5
C1102 0.1
R1116 2700
P1103
1 AN3
2 F1 (GND)
3 AN2
4 ANF
5 S SW
6 N. SW -29V
7
8 HEATER (+)
9 UNREG 5.6V
10 HEATER (-)
11 UNREG 36V
12 GND
13 GND
14 GND (MOTOR)
15 UNREG ~~11V~~
16
TO POWER SUPPLY/RF SECTION P1001 (Page:56/E-1)
16V
Changed

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

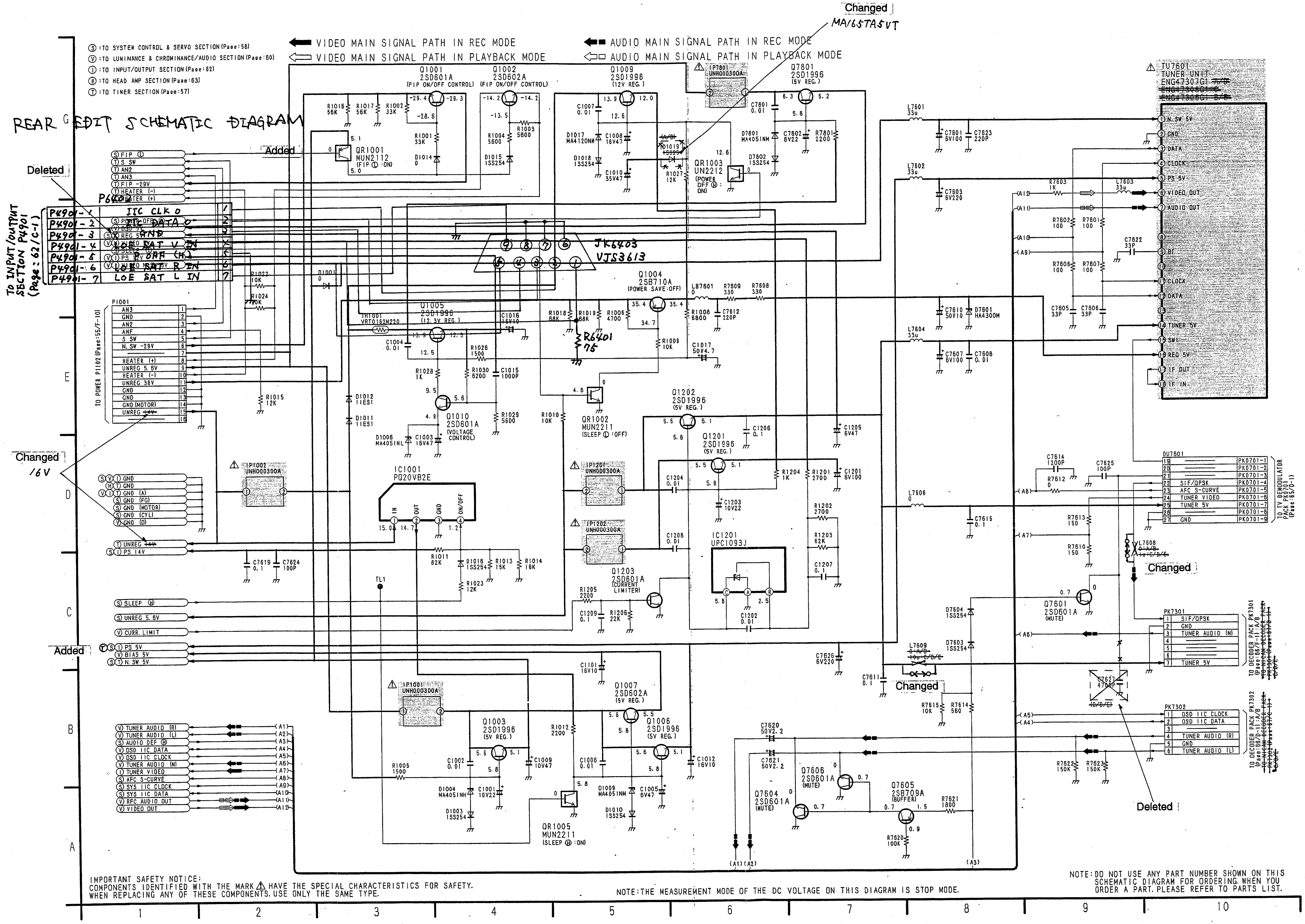
NOTE: THE MEASURMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE1: WHEN MEASURE THE VOLTAGE OR WAVEFORM ON THE POWER TRANSFORMER CIRCUIT, SET THE GND TERMINAL OF MEASURING POINT AS FOLLOWS.
PRIMARY SIDE..... ⏚
SECONDARY SIDE... ⏚

NOTE2: THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS SHOWN THE VOLTAGE WHEN INPUT AC IS 240V.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

## 9.2. POWER SUPPLY/RF SECTION IN MAIN SCHEMATIC DIAGRAM


Ⓢ :TO SYSTEM CONTROL & SERVO SECTION (Page:58)
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION (Page:60)
Ⓘ :TO INPUT/OUTPUT SECTION (Page:62)
Ⓗ :TO HEAD AMP SECTION (Page:63)
Ⓣ :TO TIMER SECTION (Page:57)

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

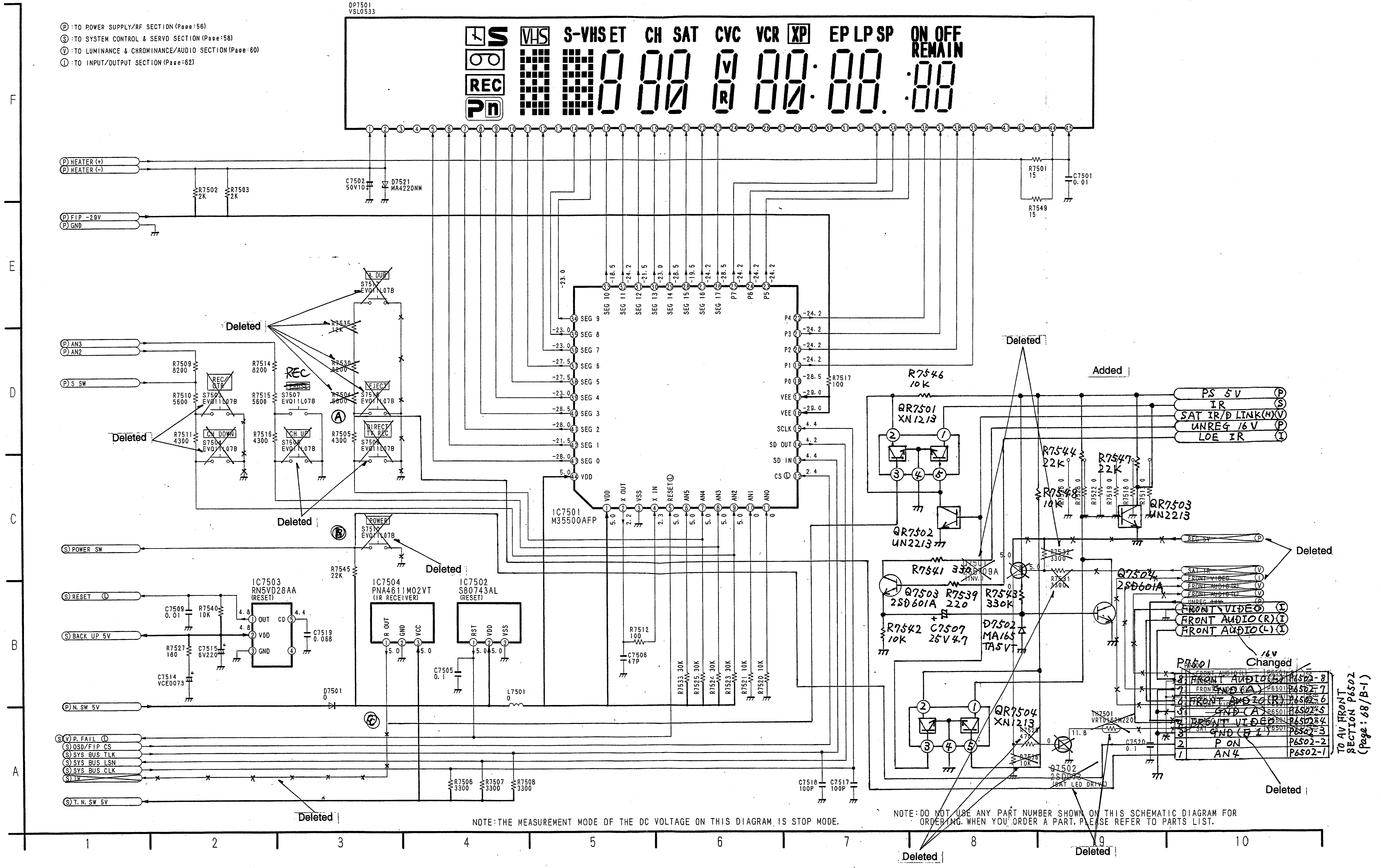
Changed
MA165TA5VT
REAR EDIT SCHEMATIC DIAGRAM
Added
Deleted
P6401
P4901-1 IIC CLK O
P4901-2 IIC DATA
P4901-3 GND
P4901-4 LOE SAT V IN
P4901-5 PS ON/OFF (H)
P4901-6 LOE SAT R IN
P4901-7 LOE SAT L IN
TO INPUT/OUTPUT SECTION P4901 (Page:62/C-1)
JK6403
VJS3613
R6401
75
Changed
16V
Q1001 2SD601A (FIP ON/OFF CONTROL)
Q1002 2SD602A (FIP ON/OFF CONTROL)
Q1009 2SD1996 (12V REG.)
Q7801 2SD1996 (5V REG.)
IP7801 UNH000300A
QR1001 MUN2112 (FIP Ⓘ :ON)
QR1003 UN2212 (POWER OFF Ⓗ : ON)
Q1004 2SB710A (POWER SAVE:OFF)
Q1005 2SD1996 (12.3V REG.)
Q1010 2SD601A (VOLTAGE CONTROL)
QR1002 MUN2211 (SLEEP Ⓘ :OFF)
Q1202 2SD1996 (5V REG.)
Q1201 2SD1996 (5V REG.)
IC1001 PQ20VB2E
IC1201 UPC1093J
Q1203 2SD601A (CURRENT LIMITER)
IP1002 UNH000300A
IP1201 UNH000300A
IP1202 UNH000300A
IP1001 UNH000300A
Q1007 2SD602A (5V REG.)
Q1003 2SD1996 (5V REG.)
Q1006 2SD1996 (5V REG.)
QR1005 MUN2211 (SLEEP Ⓗ :ON)
Q7601 2SD601A (MUTE)
Q7606 2SD601A (MUTE)
Q7604 2SD601A (MUTE)
Q7605 2SB709A (BUFFER)
TU7601 TUNER UNIT ENG47307G1
① N. SW 5V
② GND
③ DATA
④ CLOCK
⑤ PS 5V
⑥ VIDEO OUT
⑦ AUDIO OUT
⑧
⑨ BT
⑩
⑪ CLOCK
⑫ DATA
⑬
⑭ TUNER 5V
⑮ SW1
⑯ REG 5V
⑰ IF OUT
⑱ IF IN
P1001
TO POWER P1102 (Page:55/F-10)
1 AN3
2 GND
3 AN2
4 ANF
5 S SW
6 N. SW -29V
7
8 HEATER (+)
9 UNREG 5.6V
10 HEATER (-)
11 UNREG 38V
12 GND
13 GND
14 GND (MOTOR)
15 UNREG 14V
16
DU7601
TO TV DEMODULATOR PACK PK0701 (Page:65/D-1)
19 PK0701-1
20 PK0701-2
21 PK0701-3
22 SIF/QPSK PK0701-4
23 AFC S-CURVE PK0701-5
24 TUNER VIDEO PK0701-6
25 TUNER 5V PK0701-7
26 PK0701-8
27 GND PK0701-9
PK7301
TO DECODER PACK PK7301
1 SIF/QPSK
2 GND
3 TUNER AUDIO (N)
4
5
6
7 TUNER 5V
PK7302
TO DECODER PACK PK7302
1 OSD IIC CLOCK
2 OSD IIC DATA
3
4 TUNER AUDIO (R)
5 GND
6 TUNER AUDIO (L)
Ⓢ Ⓘ FIP Ⓘ
Ⓣ S SW
Ⓣ AN2
Ⓣ AN3
Ⓣ FIP -29V
Ⓣ HEATER (-)
Ⓣ HEATER (+)
Ⓢ Ⓥ Ⓘ GND
Ⓗ Ⓘ GND
Ⓥ Ⓘ GND (A)
Ⓢ GND (FG)
Ⓢ GND (MOTOR)
Ⓢ GND (CYL)
Ⓥ GND (D)
Ⓣ UNREG 14V
Ⓢ Ⓘ PS 14V
Ⓢ SLEEP Ⓗ
Ⓢ UNREG 5.6V
Ⓥ CURR. LIMIT
Ⓣ Ⓢ Ⓘ PS 5V
Ⓥ BIAS 5V
Ⓢ Ⓣ N. SW 5V
Ⓥ TUNER AUDIO (R)
Ⓥ TUNER AUDIO (L)
Ⓢ AUDIO DEF Ⓗ
Ⓥ OSD IIC DATA
Ⓥ OSD IIC CLOCK
Ⓥ TUNER AUDIO (N)
Ⓘ TUNER VIDEO
Ⓢ AFC S-CURVE
Ⓢ SYS IIC CLOCK
Ⓢ SYS IIC DATA
Ⓥ RFC AUDIO OUT
Ⓥ VIDEO OUT
TL1
L7601 L7602 L7603 L7604 L7606 L7608 L7609
Changed
Changed
Deleted
G F E D C B A
1 2 3 4 5 6 7 8 9 10

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

## 9.3. TIMER SECTION IN MAIN SCHEMATIC DIAGRAM

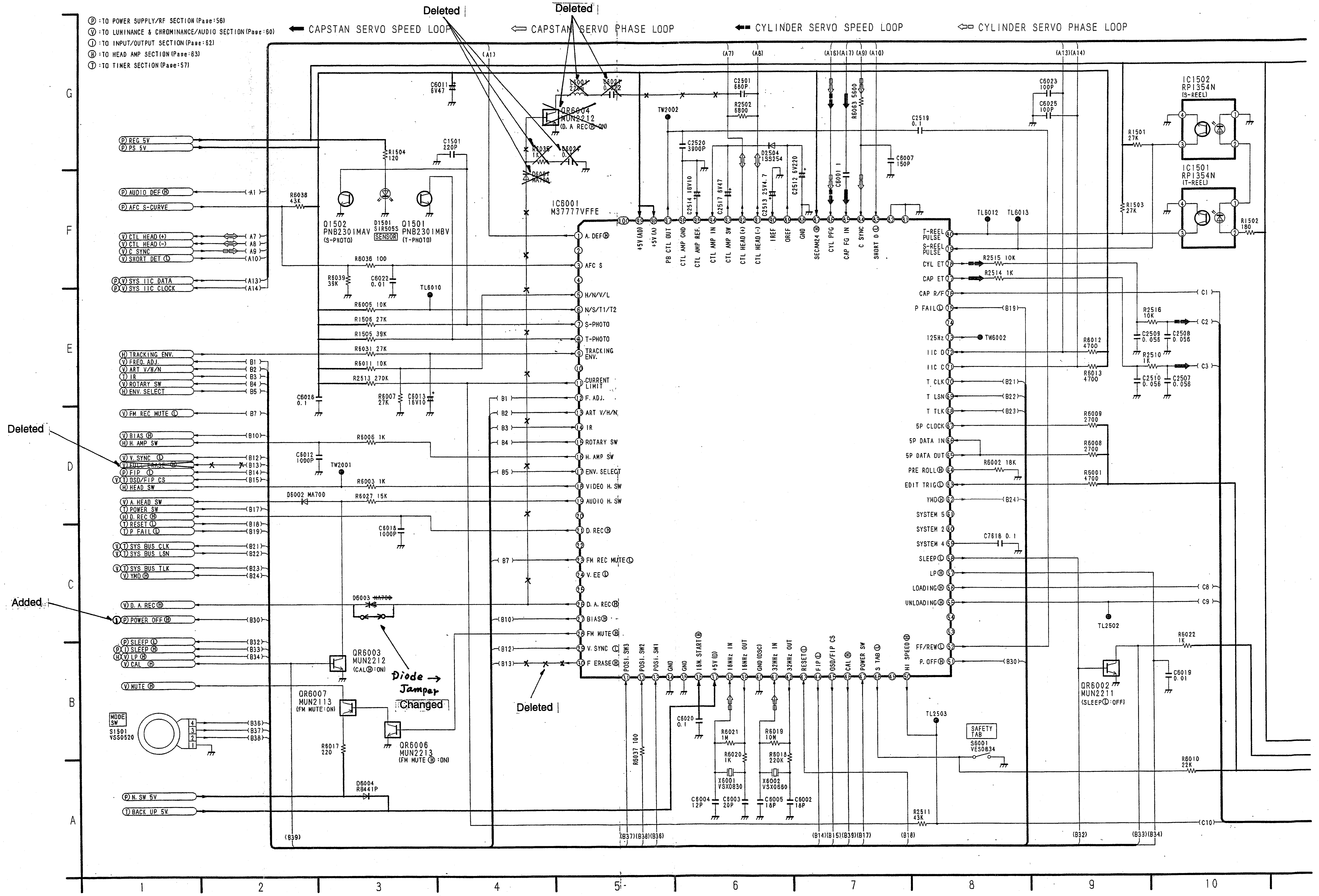

Ⓟ :TO POWER SUPPLY/RF SECTION (Page:56)
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION (Page:58)
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION (Page:60)
Ⓘ :TO INPUT/OUTPUT SECTION (Page:62)

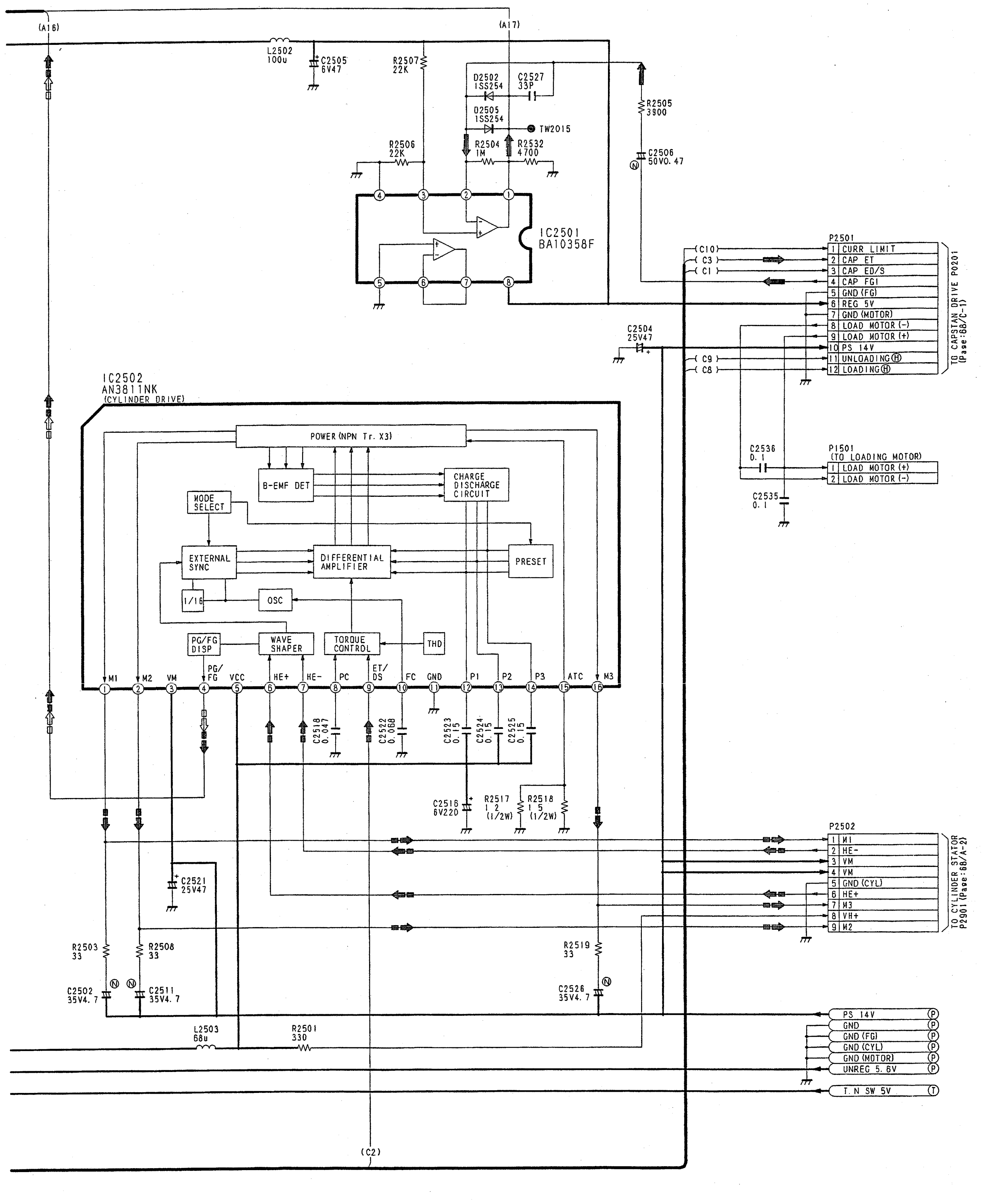
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

DP7501
VSL0533
S-VHS ET CH SAT CVC VCR XP EP LP SP ON OFF REMAIN
VHS
REC
Pn
HEATER (+)
HEATER (-)
FIP -29V
GND
R7502 2K
R7503 2K
C7502 50V10
D7521 MA4220NM
R7501 15
C7501 0.01
R7549 15
AN3
AN2
S SW
R7509 8200
R7510 5600
R7511 4300
R7514 8200
R7515 5600
R7516 4300
R7504 5600
R7505 4300
S7507 EVQ11L07B
REC
EJECT
CH UP
CH DOWN
DIRECT TV REC
POWER
R7545 22K
Deleted
Added
Changed
IC7501
M35500AFP
SEG 0
SEG 1
SEG 2
SEG 3
SEG 4
SEG 5
SEG 6
SEG 7
SEG 8
SEG 9
SEG 10
VDD
X OUT
VSS
X IN
RESET
AN5
AN4
AN3
AN2
AN1
AN0
CS
SD IN
SD OUT
SCLK
VEE
P0
P1
P2
P3
P4
R7517 100
R7512 100
C7506 47P
R7533 30K
R7525 30K
R7524 30K
R7523 30K
R7521 10K
R7520 10K
POWER SW
RESET
BACK UP 5V
N. SW 5V
P. FAIL
OSD/FIP CS
SYS BUS TLK
SYS BUS LSN
SYS BUS CLK
IR
T. N. SW 5V
IC7503
RN5VD28AA
(RESET)
OUT
VDD
GND
CD
C7509 0.01
R7540 10K
R7527 180
C7515 6V220
C7514 VCE0073
C7519 0.068
IC7504
PNA4611M02VT
(IR RECEIVER)
IC7502
S80743AL
(RESET)
C7505 0.1
D7501 0
L7501 0
R7506 3300
R7507 3300
R7508 3300
C7518 100P
C7517 100P
R7546 10K
QR7501 XN1213
QR7502 UN2213
QR7503 UN2213
QR7504 XN1213
R7544 22K
R7547 22K
R7548 10K
R7522 0
R7519 0
R7518 0
R7541 330
R7539 220
R7543 330K
R7542 10K
C7507 25V4.7
D7502 MA165 TA5V
Q7503 2SD601A
Q7504 2SD601A
R7532 3300
R7531 3300
R7536 10K
Q7502 2SD973 (SAT LED DRIVE)
TH7501 VRT0152M220
C7520 0.1
PS 5V
IR
SAT IR/D LINK (H)
UNREG 16V
LOE IR
REG 5V
SAT IR
FRONT VIDEO
FRONT AUDIO (R)
FRONT AUDIO (L)
UNREG 16V
P7501
8 FRONT AUDIO (L) P6502-8
7 GND (A) P6502-7
6 FRONT AUDIO (R) P6502-6
5 GND (A) P6502-5
4 FRONT VIDEO P6502-4
3 GND (V) P6502-3
2 P ON P6502-2
1 AN4 P6502-1
TO AV FRONT SECTION P6502 (Page: 68/B-1)
A B C D E F
1 2 3 4 5 6 7 8 9 10

# 9.4. SYSTEM CONTROL & SERVO SECTION IN MAIN SCHEMATIC DIAGRAM


Ⓟ :TO POWER SUPPLY/RF SECTION (Page:56)
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION (Page:60)
Ⓘ :TO INPUT/OUTPUT SECTION (Page:62)
Ⓗ :TO HEAD AMP SECTION (Page:63)
Ⓣ :TO TIMER SECTION (Page:57)
CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP
CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP
Deleted
Deleted
Deleted
Added
Deleted
Diode → Jamper
Changed
Ⓟ REG 5V
Ⓟ PS 5V
Ⓟ AUDIO DEF Ⓗ
Ⓟ AFC S-CURVE
Ⓥ CTL HEAD (+)
Ⓥ CTL HEAD (-)
Ⓥ C SYNC
Ⓥ SHORT DET Ⓛ
ⓅⓋ SYS IIC DATA
ⓅⓋ SYS IIC CLOCK
Ⓗ TRACKING ENV.
Ⓥ FREQ. ADJ.
Ⓥ ART V/H/N
Ⓣ IR
Ⓥ ROTARY SW
Ⓗ ENV. SELECT
Ⓥ FM REC MUTE Ⓛ
Ⓥ BIAS Ⓗ
Ⓗ H. AMP SW
Ⓥ V. SYNC Ⓛ
Ⓥ ~~FULL ERASE Ⓗ~~
Ⓟ FIP Ⓛ
ⓋⓉ OSD/FIP CS
Ⓗ HEAD SW
Ⓥ A. HEAD SW
Ⓣ POWER SW
Ⓗ D. REC Ⓗ
Ⓣ RESET Ⓛ
Ⓣ P FAIL Ⓛ
ⓋⓉ SYS BUS CLK
ⓋⓉ SYS BUS LSN
ⓋⓉ SYS BUS TLK
Ⓥ YMO Ⓗ
Ⓥ D. A. REC Ⓗ
ⒾⓅ POWER OFF Ⓗ
Ⓟ SLEEP Ⓛ
ⓅⒾ SLEEP Ⓗ
ⒽⓋ LP Ⓗ
Ⓥ CAL Ⓗ
Ⓥ MUTE Ⓗ
MODE SW
S1501
VSS0520
Ⓟ N. SW 5V
Ⓣ BACK UP 5V
(A1) (A7) (A8) (A9) (A10) (A13) (A14) (A16) (A17)
(B1) (B2) (B3) (B4) (B5) (B7) (B10) (B12) (B13) (B14) (B15) (B17) (B18) (B19) (B21) (B22) (B23) (B24) (B30) (B32) (B33) (B34) (B36) (B37) (B38) (B39)
(C1) (C2) (C3) (C8) (C9) (C10)
IC6001
M37777VFFE
IC1502
RP1354N
(S-REEL)
IC1501
RP1354N
(T-REEL)
Q1502
PNB2301MAV
(S-PHOTO)
D1501
SIR505S
SENSOR
Q1501
PNB2301MBV
(T-PHOTO)
QR6004
MUN2212
(D. A REC Ⓗ:ON)
QR6003
MUN2212
(CAL Ⓗ:ON)
QR6007
MUN2113
(FM MUTE:ON)
QR6006
MUN2213
(FM MUTE Ⓗ:ON)
QR6002
MUN2211
(SLEEP Ⓛ:OFF)
D6002 MA700
D6003 MA700
D6004
RB441P
D2504
1SS254
SAFETY TAB
S6001
VES0834
TW2001
TW2002
TW6002
TL6010
TL6012
TL6013
TL2502
TL2503
X6001
VSX0830
X6002
VSX0660
C6011 6V47
C1501 220P
R1504 120
R6038 43K
R6036 100
R6039 39K
C6022 0.01
R6005 10K
R1506 27K
R1505 39K
R6031 27K
R6011 10K
R2513 270K
C6026 0.1
R6007 27K
C6013 16V10
R6006 1K
C6012 1000P
R6003 1K
R6027 15K
C6018 1000P
R6017 220
C2501 680P
R2502 6800
C2520 3900P
C2514 16V10
C2517 6V47
C2513 25V4.7
C2512 6V220
C6001 1
C6007 150P
C2519 0.1
C6023 100P
C6025 100P
R1501 27K
R1503 27K
R1502 180
R2515 10K
R2514 1K
R2516 10K
C2509 0.056
C2508 0.056
R2510 1K
C2510 0.056
C2507 0.056
R6012 4700
R6013 4700
R6009 2700
R6008 2700
R6002 18K
R6001 4700
C7618 0.1
R6022 1K
C6019 0.01
R6010 22K
R2511 43K
R6037 100
C6020 0.1
R6021 1M
R6020 1K
R6019 10M
R6018 220K
C6004 12P
C6003 20P
C6005 18P
C6002 18P
1 A. DEF Ⓗ
2
3 AFC S
4
5 H/N/V/L
6 N/S/T1/T2
7 S-PHOTO
8 T-PHOTO
9 TRACKING ENV.
10
11 CURRENT LIMIT
12 F. ADJ.
13 ART V/H/N
14 IR
15 ROTARY SW
16 H. AMP SW
17 ENV. SELECT
18 VIDEO H. SW
19 AUDIO H. SW
20
21 D. REC Ⓗ
22
23 FM REC MUTE Ⓛ
24 V. EE Ⓛ
25
26 D. A. REC Ⓗ
27 BIAS Ⓗ
28 FM MUTE Ⓗ
29 V. SYNC Ⓛ
30 F ERASE Ⓗ
31 POSI. SW3
32 POSI. SW2
33 POSI. SW1
34 GND
35 GND
36 16M. START Ⓗ
37 +5V (D)
38 16MHz IN
39 16MHz OUT
40 GND (OSC)
41 32MHz IN
42 32MHz OUT
43 RESET Ⓛ
44 FIP Ⓛ
45 OSD/FIP CS
46 CAL Ⓗ
47 POWER SW
48 S TAB Ⓛ
49
50 HI SPEED Ⓗ
51 P. OFF Ⓗ
52 FF/REW Ⓛ
53
54
55 UNLOADING Ⓗ
56 LOADING Ⓗ
57 LP Ⓗ
58 SLEEP Ⓛ
59 SYSTEM 4
60 SYSTEM 2
61 SYSTEM 5
62 YMO Ⓗ
63 EDIT TRIG Ⓛ
64 PRE ROLL Ⓗ
65 5P DATA OUT
66 5P DATA IN
67 5P CLOCK
68 T TLK
69 T LSN
70 T CLK
71 IIC C
72 IIC D
73 125Hz
74
75 P FAIL Ⓛ
76 CAP R/F
77 CAP ET
78 CYL ET
79 S-REEL PULSE
80 T-REEL PULSE
81
82
83 SHORT D Ⓛ
84 C SYNC
85 CAP FG IN
86 CYL PFG
87 SECAM24 Ⓗ
88 GND
89 OREF
90 IREF
91 CTL HEAD (-)
92 CTL HEAD (+)
93 CTL AMP SW
94 CTL AMP IN
95 CTL AMP REF.
96 CTL AMP GND
97 PB CTL OUT
98 +5V (A)
99 +5V (AD)
100
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10


(A16)
(A17)
L2502 100u
C2505 6V47
R2507 22K
D2502 1SS254
C2527 33P
D2505 1SS254
TW2015
R2505 3900
R2506 22K
R2504 1M
R2532 4700
C2506 50V0.47
IC2501 BA10358F
P2501
1 CURR LIMIT
2 CAP ET
3 CAP ED/S
4 CAP FGI
5 GND (FG)
6 REG 5V
7 GND (MOTOR)
8 LOAD MOTOR (-)
9 LOAD MOTOR (+)
10 PS 14V
11 UNLOADING
12 LOADING
TO CAPSTAN DRIVE P0201 (Page 68/C-1)
(C10)
(C3)
(C1)
(C9)
(C8)
C2504 25V47
C2536 0.1
C2535 0.1
P1501 (TO LOADING MOTOR)
1 LOAD MOTOR (+)
2 LOAD MOTOR (-)
IC2502 AN3811NK (CYLINDER DRIVE)
POWER (NPN Tr. X3)
B-EMF DET
CHARGE DISCHARGE CIRCUIT
MODE SELECT
EXTERNAL SYNC
DIFFERENTIAL AMPLIFIER
PRESET
1/16
OSC
PG/FG DISP
WAVE SHAPER
TORQUE CONTROL
THD
M1
M2
VM
PG/FG
VCC
HE+
HE-
PC
ET/DS
FC
GND
P1
P2
P3
ATC
M3
C2518 0.047
C2522 0.068
C2523 0.15
C2524 0.15
C2525 0.15
C2516 6V220
R2517 1.2 (1/2W)
R2518 1.5 (1/2W)
P2502
1 M1
2 HE-
3 VM
4 VM
5 GND (CYL)
6 HE+
7 M3
8 VH+
9 M2
TO CYLINDER STATOR P2901 (Page 68/A-2)
C2521 25V47
R2503 33
R2508 33
R2519 33
C2502 35V4.7
C2511 35V4.7
C2526 35V4.7
L2503 68u
R2501 330
PS 14V
GND
GND (FG)
GND (CYL)
GND (MOTOR)
UNREG 5.8V
T.N SW 5V
(C2)

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

11 12 13 14 15

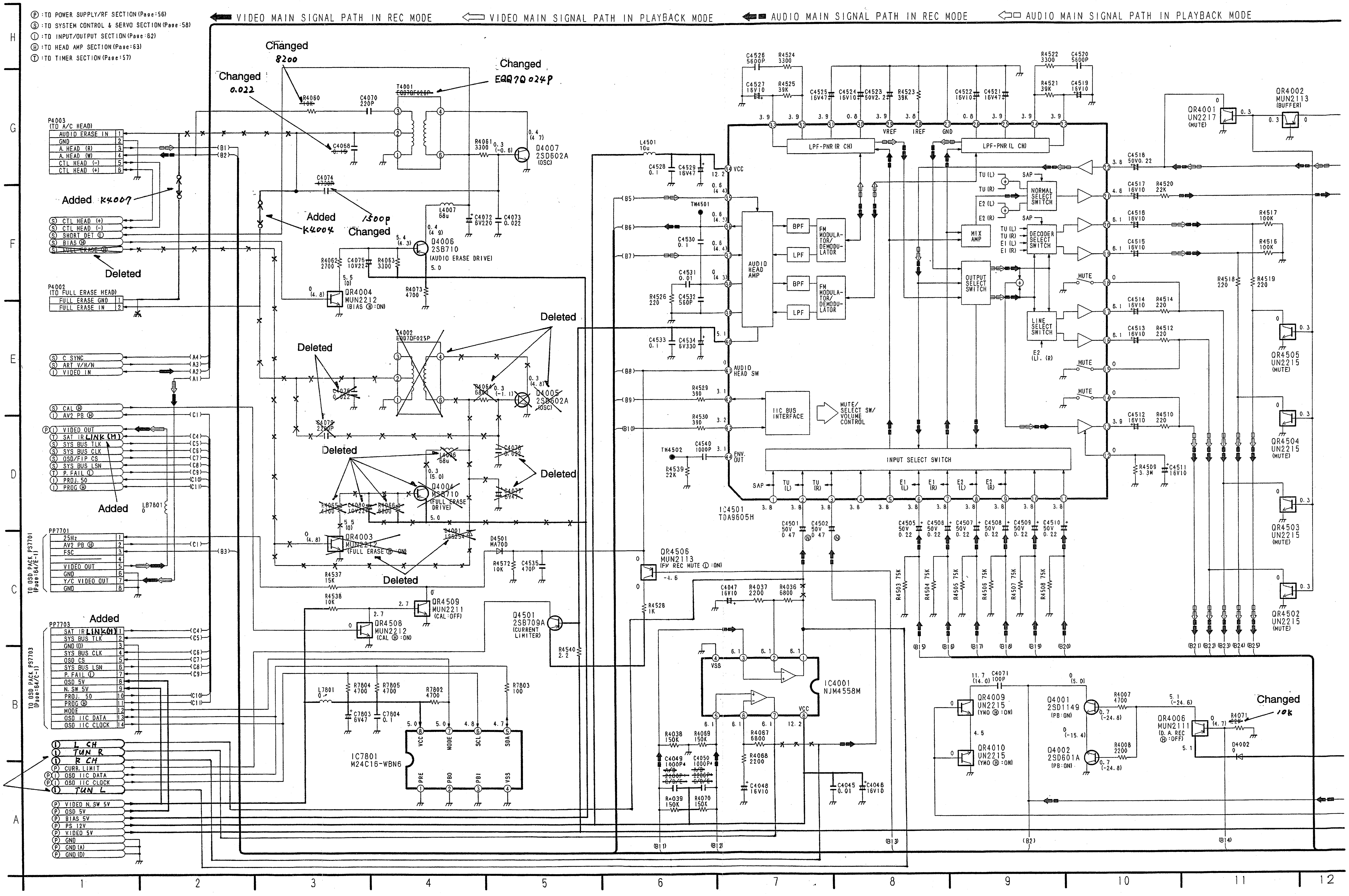
## SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART (SP MODE)

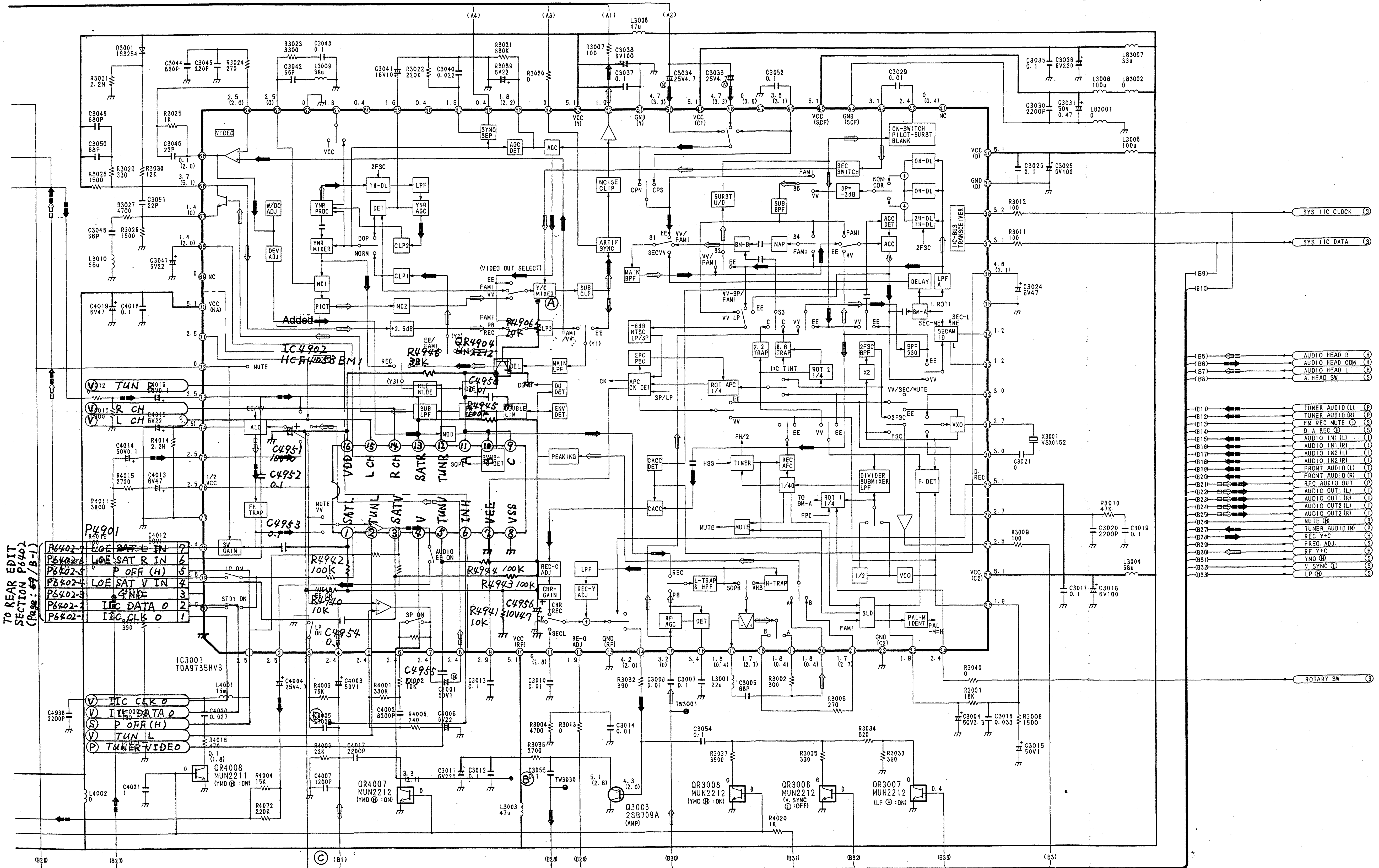
| Ref. No. | IC1501 | | | | | | | | IC1502 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODE | 1 | 2 | 3 | 4 | | | | | 1 | 2 | 3 | 4 | | | | | | | | |
| STOP | 1.1 | 2.3 | 5.1 | 0 | | | | | 0 | 1.1 | 5.1 | 0 | | | | | | | | |
| PLAY | 1.1 | 2.3 | 4.9 | 0 | | | | | 0 | 1.1 | 5.0 | 0 | | | | | | | | |
| REC | 1.1 | 2.3 | 4.1 | 0 | | | | | 0 | 1.1 | 5.1 | 0 | | | | | | | | |
| F.F | 1.1 | 2.3 | 2.4 | 0 | | | | | 0 | 1.1 | 2.3 | 0 | | | | | | | | |
| REW | 1.1 | 2.3 | 2.4 | 0 | | | | | 0 | 1.1 | 2.4 | 0 | | | | | | | | |
| Ref. No. | IC2501 | | | | | | | | | | | | | | | | | | | |
| MODE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | |
| STOP | 2.5 | 2.5 | 2.5 | 0 | 0 | 0 | 0 | 5.0 | | | | | | | | | | | | |
| PLAY | 2.5 | 2.5 | 2.5 | 0 | 0 | 0 | 0 | 5.0 | | | | | | | | | | | | |
| REC | 2.5 | 2.5 | 2.5 | 0 | 0 | 0 | 0 | 5.0 | | | | | | | | | | | | |
| F.F | 2.5 | 2.5 | 2.5 | 0 | 0 | 0 | 0 | 5.1 | | | | | | | | | | | | |
| REW | 2.5 | 2.5 | 2.5 | 0 | 0 | 0 | 0 | 5.1 | | | | | | | | | | | | |
| Ref. No. | IC2502 | | | | | | | | | | | | | | | | | | | |
| MODE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | |
| STOP | 14.5 | 14.5 | 14.7 | 1.1 | 5.0 | 1.1 | 1.1 | 0.5 | 2.4 | 1.4 | 0 | 3.8 | 3.8 | 3.8 | 0 | 14.5 | | | | |
| PLAY | 14.4 | 14.4 | 14.7 | 1.1 | 5.0 | 1.1 | 1.1 | 0.5 | 2.4 | 1.4 | 0 | 3.8 | 3.8 | 3.8 | 0 | 14.4 | | | | |
| REC | 14.4 | 14.4 | 14.7 | 1.1 | 5.0 | 1.1 | 1.1 | 0.5 | 2.4 | 1.4 | 0 | 3.8 | 3.8 | 3.8 | 0 | 14.4 | | | | |
| F.F | 14.2 | 14.2 | 14.4 | 1.1 | 5.1 | 1.1 | 1.1 | 0.5 | 2.5 | 1.4 | 0 | 3.9 | 3.8 | 3.8 | 0 | 14.2 | | | | |
| REW | 14.1 | 14.1 | 14.4 | 1.1 | 5.1 | 1.1 | 1.1 | 0.6 | 2.5 | 1.4 | 0 | 3.9 | 3.8 | 3.8 | 0 | 14.2 | | | | |
| Ref. No. | IC6001 | | | | | | | | | | | | | | | | | | | |
| MODE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| STOP | 4.1 | 0 | 2.8 | 0 | 3.7 | 5.1 | 5.1 | 4.6 | 1.7 | 0 | 0 | 1.9 | 0 | 5.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| PLAY | 4.4 | 0 | 2.8 | 0 | 3.7 | 5.1 | 5.1 | 4.5 | 3.5 | 0 | 4.8 | 1.9 | 0 | 5.1 | 2.4 | 0 | 4.9 | 2.4 | 2.4 | 0 |
| REC | 4.4 | 0 | 2.8 | 0 | 3.7 | 5.1 | 5.1 | 4.5 | 2.2 | 0 | 4.8 | 1.9 | 0 | 5.0 | 2.4 | 0 | 4.7 | 2.4 | 0 | 0 |
| F.F | 4.3 | 0 | 2.7 | 0 | 3.6 | 5.0 | 4.9 | 3.7 | 0.8 | 0 | 4.9 | 1.9 | 0 | 5.0 | 0 | 0 | 2.7 | 2.3 | 0 | 0 |
| REW | 4.3 | 0 | 2.6 | 0 | 3.6 | 5.0 | 4.9 | 3.8 | 2.7 | 0 | 5.0 | 1.9 | 0 | 5.0 | 0 | 0 | 0.0 | 2.3 | 0 | 0 |
| Ref. No. | IC6001 | | | | | | | | | | | | | | | | | | | |
| MODE | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| STOP | 0 | 0 | 0 | 1.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.8 | 4.8 | 0 | 0 | 4.7 | 4.7 | 2.2 | 2.2 | 0 |
| PLAY | 0 | 0 | 4.8 | 4.8 | 0 | 1.3 | 0 | 0 | 0 | 0 | 4.8 | 0 | 0 | 0 | 0 | 4.8 | 4.8 | 2.1 | 2.0 | 0 |
| REC | 4.8 | 0 | 4.8 | 0 | 0 | 4.7 | 4.8 | 0 | 0 | 4.8 | 4.8 | 0 | 0 | 0 | 0 | 4.8 | 4.8 | 2.0 | 2.0 | 0 |
| F.F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.7 | 4.7 | 0 | 0 | 0 | 4.7 | 4.7 | - | - | 0 |
| REW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.7 | 4.7 | 0 | 0 | 0 | 4.7 | 4.7 | - | - | 0 |
| Ref. No. | IC6001 | | | | | | | | | | | | | | | | | | | |
| MODE | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| STOP | 1.2 | 1.3 | 4.7 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.7 | 0 | 4.8 |
| PLAY | 0.9 | 1.3 | 4.8 | 0 | 2.4 | 0 | 5.1 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.8 | 0 | 4.8 |
| REC | 1.1 | 1.3 | 4.8 | 4.8 | 0.6 | 0 | 5.1 | 0 | 0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.7 | 0 | 4.8 |
| F.F | 1.1 | 1.3 | 4.7 | 0 | 2.4 | 0 | 5.1 | 0 | 0 | 4.6 | 0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 4.7 | 0 | 4.8 |
| REW | 1.1 | 1.3 | 4.7 | 0 | 2.4 | 0 | 5.1 | 0 | 0 | 4.6 | 0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 4.7 | 0 | 4.8 |
| Ref. No. | IC6001 | | | | | | | | | | | | | | | | | | | |
| MODE | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| STOP | 0 | 0 | 5.1 | 0 | 5.0 | 5.0 | 5.0 | 4.4 | 4.1 | 4.5 | 3.1 | 3.0 | 0 | 0 | 5.0 | 0 | 0 | 2.5 | 5.1 | 5.1 |
| PLAY | 0 | 0 | 5.1 | 0 | 5.1 | 5.1 | 5.1 | 4.5 | 4.0 | 4.5 | 0 | 0 | 0 | 0 | 5.1 | 0 | 2.4 | 2.4 | 5.0 | 4.9 |
| REC | 0 | 0 | 5.1 | 0 | 5.1 | 5.1 | 5.1 | 4.5 | 4.0 | 0.4 | 3.2 | 3.1 | 0 | 0 | 5.1 | 0 | 2.4 | 2.4 | 5.1 | 4.1 |
| F.F | 0 | 0 | 5.1 | 0 | 5.0 | 5.0 | 5.0 | 4.5 | 4.1 | 4.4 | 3.1 | 3.0 | 0 | 0 | 5.0 | 0 | 4.7 | 2.5 | 2.3 | 2.4 |
| REW | 0 | 0 | 5.1 | 0 | 5.0 | 5.0 | 5.0 | 4.5 | 4.1 | 4.4 | 3.1 | 3.0 | 0 | 0 | 5.0 | 4.7 | 3.0 | 2.4 | 2.4 | 2.4 |
| Ref. No. | IC6001 | | | | | | | | | | | | | | | | | | | |
| MODE | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| STOP | 0 | 0 | 0.3 | 0.4 | 2.5 | 1.1 | 5.0 | 0 | 2.5 | 2.5 | 0 | 0 | 0 | 2.5 | 2.5 | 0 | 2.4 | 5.0 | 5.0 | 0 |
| PLAY | 0 | 0 | 0.3 | 0.4 | 2.5 | 1.1 | 5.0 | 0 | 2.5 | 2.5 | 0 | 0 | 0 | 2.4 | 2.5 | 0 | 2.5 | 5.1 | 5.0 | 0 |
| REC | 0 | 0 | 4.7 | 0.8 | 3.9 | 1.0 | 5.0 | 0 | 2.5 | 2.5 | 2.3 | 2.7 | 0 | 2.5 | 2.5 | 0 | 2.5 | 5.1 | 5.0 | 0 |
| F.F | 0 | 0 | 0.3 | 0.4 | 2.5 | 1.1 | 5.0 | 0 | 2.5 | 2.5 | 0 | 0 | 0 | 2.5 | 2.5 | 0 | 2.4 | 5.0 | 5.0 | 0 |
| REW | 0 | 0 | 0.3 | 0.4 | 2.5 | 1.1 | 5.0 | 0 | 2.5 | 2.5 | 0 | 0 | 0 | 2.5 | 2.5 | 0 | 2.4 | 5.0 | 5.0 | 0 |

## SYSTEM CONTROL & SERVO TRs DC VOLTAGE CHART (SP MODE)

| Ref. No. | Q1501 | | | | Q1502 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODE | + | − | | | + | − | | | | | | | | | | | | | | |
| STOP | 4.5 | 0 | | | 4.9 | 0 | | | | | | | | | | | | | | |
| PLAY | 4.5 | 0 | | | 4.9 | 0 | | | | | | | | | | | | | | |
| REC | 4.5 | 0 | | | 4.9 | 0 | | | | | | | | | | | | | | |
| F.F | 4.3 | 0 | | | 4.8 | 0 | | | | | | | | | | | | | | |
| REW | 4.3 | 0 | | | 4.8 | 0 | | | | | | | | | | | | | | |
| Ref. No. | QR6002 | | | | QR6003 | | | | QR6004 | | | | QR6006 | | | | QR6007 | | | |
| MODE | E | C | B | | E | C | B | | E | C | B | | E | C | B | | E | C | B | |
| STOP | -0.1 | 0 | 4.8 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 5.1 | 0 | | 5.1 | 0 | 5.1 | |
| PLAY | 0 | 0 | 4.8 | | 0 | 2.2 | 0 | | 0 | 0 | 0 | | 0 | 5.1 | 0 | | 5.1 | 0 | 5.1 | |
| REC | 0 | 0 | 4.7 | | 0 | 0 | 0 | | 0 | 0 | 4.7 | | 0 | 5.1 | 0 | | 5.1 | 0 | 5.1 | |
| F.F | 0.1 | 0 | 4.7 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 5.1 | 0 | | 5.1 | 0 | 5.1 | |
| REW | 0 | 0 | 4.7 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 5.1 | 0 | | 5.1 | 0 | 5.1 | |

## 9.5. LUMINANCE & CHROMINANCE/AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM


Ⓟ :TO POWER SUPPLY/RF SECTION (Page:56)
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION (Page:58)
Ⓘ :TO INPUT/OUTPUT SECTION (Page:62)
Ⓗ :TO HEAD AMP SECTION (Page:63)
Ⓣ :TO TIMER SECTION (Page:57)
VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE
Changed
8200
Changed
0.022
Changed
EQQ7Q024P
Added K4007
Added
K4004
1500P
Changed
Deleted
Added
Changed
10k
P4003 (TO A/C HEAD)
AUDIO ERASE IN
GND
A. HEAD (R)
A. HEAD (W)
CTL HEAD (-)
CTL HEAD (+)
P4002 (TO FULL ERASE HEAD)
FULL ERASE GND
FULL ERASE IN
T4001
T4002
Q4007 2SD602A (OSC)
Q4006 2SB710 (AUDIO ERASE DRIVE)
QR4004 MUN2212 (BIAS Ⓢ:ON)
Q4005 2SD602A (OSC)
Q4004 2SB710 (FULL ERASE DRIVE)
QR4003 MUN2212 (FULL ERASE Ⓢ:ON)
QR4509 MUN2211 (CAL:OFF)
QR4508 MUN2212 (CAL Ⓗ:ON)
Q4501 2SB709A (CURRENT LIMITER)
QR4506 MUN2113 (FV REC MUTE Ⓘ:ON)
IC7801 M24C16-WBN6
IC4501 TDA9605H
IC4001 NJM4558M
AUDIO HEAD AMP
LPF-PNR (R CH)
LPF-PNR (L CH)
BPF
LPF
FM MODULATOR/DEMODULATOR
MIX AMP
NORMAL SELECT SWITCH
DECODER SELECT SWITCH
OUTPUT SELECT SWITCH
LINE SELECT SWITCH
IIC BUS INTERFACE
MUTE/SELECT SW/VOLUME CONTROL
INPUT SELECT SWITCH
QR4001 UN2217 (MUTE)
QR4002 MUN2113 (BUFFER)
QR4505 UN2215 (MUTE)
QR4504 UN2215 (MUTE)
QR4503 UN2215 (MUTE)
QR4502 UN2215 (MUTE)
QR4009 UN2215 (YMO Ⓢ:ON)
QR4010 UN2215 (YMO Ⓢ:ON)
Q4001 2SD1149 (PB:ON)
Q4002 2SD601A (PB:ON)
QR4006 MUN2111 (D. A. REC Ⓢ:OFF)
TO OSD PACK PS7701 (Page:64/E-1)
PP7701
25Hz
AV2 PB Ⓗ
FSC
VIDEO OUT
GND
Y/C VIDEO OUT
TO OSD PACK PS7703 (Page:64/C-1)
PP7703
SAT IR LINK(H)
SYS BUS TLK
SYS BUS CLK
OSD CS
SYS BUS LSN
P. FAIL Ⓘ
OSD 5V
N. SW 5V
PROJ. 50
PROG Ⓗ
MODE
OSD IIC DATA
OSD IIC CLOCK
L CH
TUN R
R CH
CURR. LIMIT
TUN L
VIDEO N. SW 5V
BIAS 5V
PS 12V
VIDEO 5V
GND (A)
GND (D)
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H



IC3001
TDA9735HV3
IC4902
HCF4053BM1
QR4904
UN2212
TO REAR EDIT SECTION P6402 (Page: /B-1)
P4901
P6402-7 LOE SAT L IN 7
P6402-6 LOE SAT R IN 6
P6402-5 P OFF (H) 5
P6402-4 LOE SAT V IN 4
P6402-3 GND 3
P6402-2 IIC DATA O 2
P6402-1 IIC CLK O 1
TUN R
R CH
L CH
IIC CLK O
IIC DATA O
P OFF (H)
TUN L
TUNER VIDEO
SAT L
TUN L
R CH
SATR
TUNR
VDD
SAT
SATV
V
TUNV
INH
VEE
VSS
C
Added
QR4008 MUN2211 (YMD Ⓗ :ON)
QR4007 MUN2212 (YMD Ⓗ :ON)
Q3003 2SB709A (AMP)
QR3008 MUN2212 (YMD Ⓗ :ON)
QR3006 MUN2212 (V. SYNC Ⓛ :OFF)
QR3007 MUN2212 (LP Ⓗ :ON)
X3001 VSX0152
SYS IIC CLOCK
SYS IIC DATA
AUDIO HEAD R
AUDIO HEAD COM
AUDIO HEAD L
A. HEAD SW
TUNER AUDIO (L)
TUNER AUDIO (R)
FM REC MUTE Ⓛ
D. A. REC Ⓗ
AUDIO IN1 (L)
AUDIO IN1 (R)
AUDIO IN2 (L)
AUDIO IN2 (R)
FRONT AUDIO (L)
FRONT AUDIO (R)
RFC AUDIO OUT
AUDIO OUT1 (L)
AUDIO OUT1 (R)
AUDIO OUT2 (L)
AUDIO OUT2 (R)
MUTE Ⓗ
TUNER AUDIO (M)
REC Y+C
FREQ. ADJ.
RF Y+C
YMD Ⓗ
V SYNC Ⓛ
LP Ⓗ
ROTARY SW
(A4)
(A3)
(A1)
(A2)
(B1)
(B3)
(B9)
(B10)
(B26)
(B27)
(B28)
(B29)
(B30)
(B31)
(B32)
(B33)
Ⓒ
Ⓐ
Ⓑ
Ⓝ
NC
VIDEO
SYNC SEP
AGC DET
AGC
NOISE CLIP
ARTIF SYNC
BURST U/D
SUB BPF
SEC SWITCH
SP= -3dB
CK-SWITCH PILOT-BURST BLANK
OH-DL
2H-DL 1H-DL
ACC DET
ACC
DELAY
LPF A
I²C BUS TRANSCEIVER
MAIN BPF
1H-DL
LPF
YNR PROC
YNR AGC
DET
W/DC ADJ
DEV ADJ
YNR MIXER
CLP2
CLP1
NC1
PICT
NC2
+2.5dB
Y/C MIXER
SUB CLP
LP3
DEL
MAIN LPF
NLE NLDE
DO DET
ENV DET
SUB LPF
MOD
DOUBLE LIM
SYNC DET
PEAKING
ALC
FH TRAP
SW GAIN
REC-C ADJ
CHR-GAIN
REC-Y ADJ
LPF
RF AGC
DET
L-TRAP & HPF
H-TRAP
APC CK DET
EPC PEC
-6dB NTSC LP/SP
ROT APC 1/4
2.2 TRAP
8.6 TRAP
ROT 2 1/4
2FSC BPF
X2
BPF 630
SECAM ID
VXO
TIMER
REC AFC
1/40
ROT 1 1/4
DIVIDER SUBMIXER LPF
F. DET
MUTE
CACC DET
CACC
1/2
VCO
SLD
PAL-M IDENT
(VIDEO OUT SELECT)

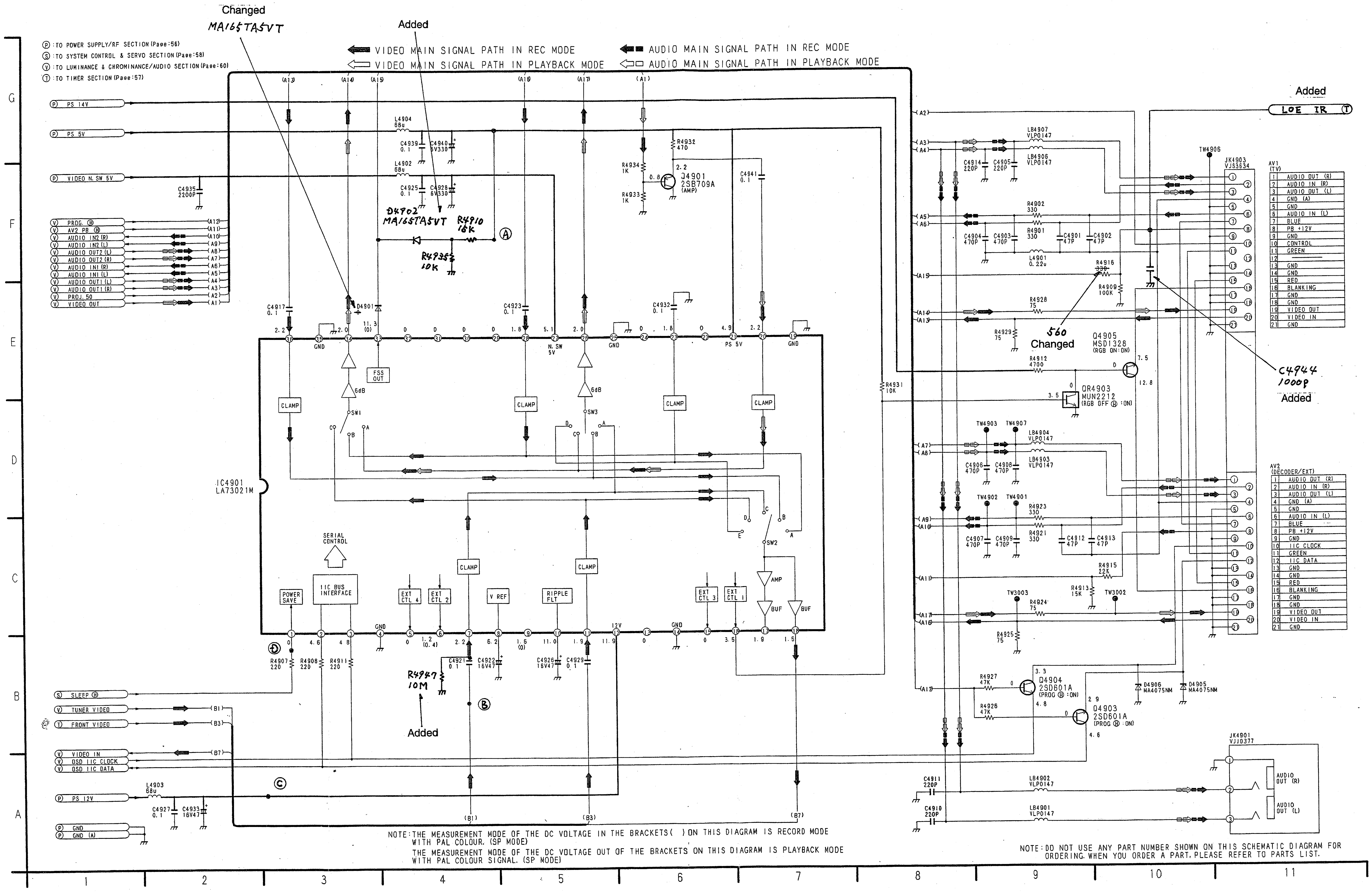
NOTE:THE MEASUREMENT MODE OF THE DC VLOLTAGE IN THE BRACKETS(  )ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR. (SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL. (SP MODE)

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

12 13 14 15 16 17 18 19 20 21 22 23

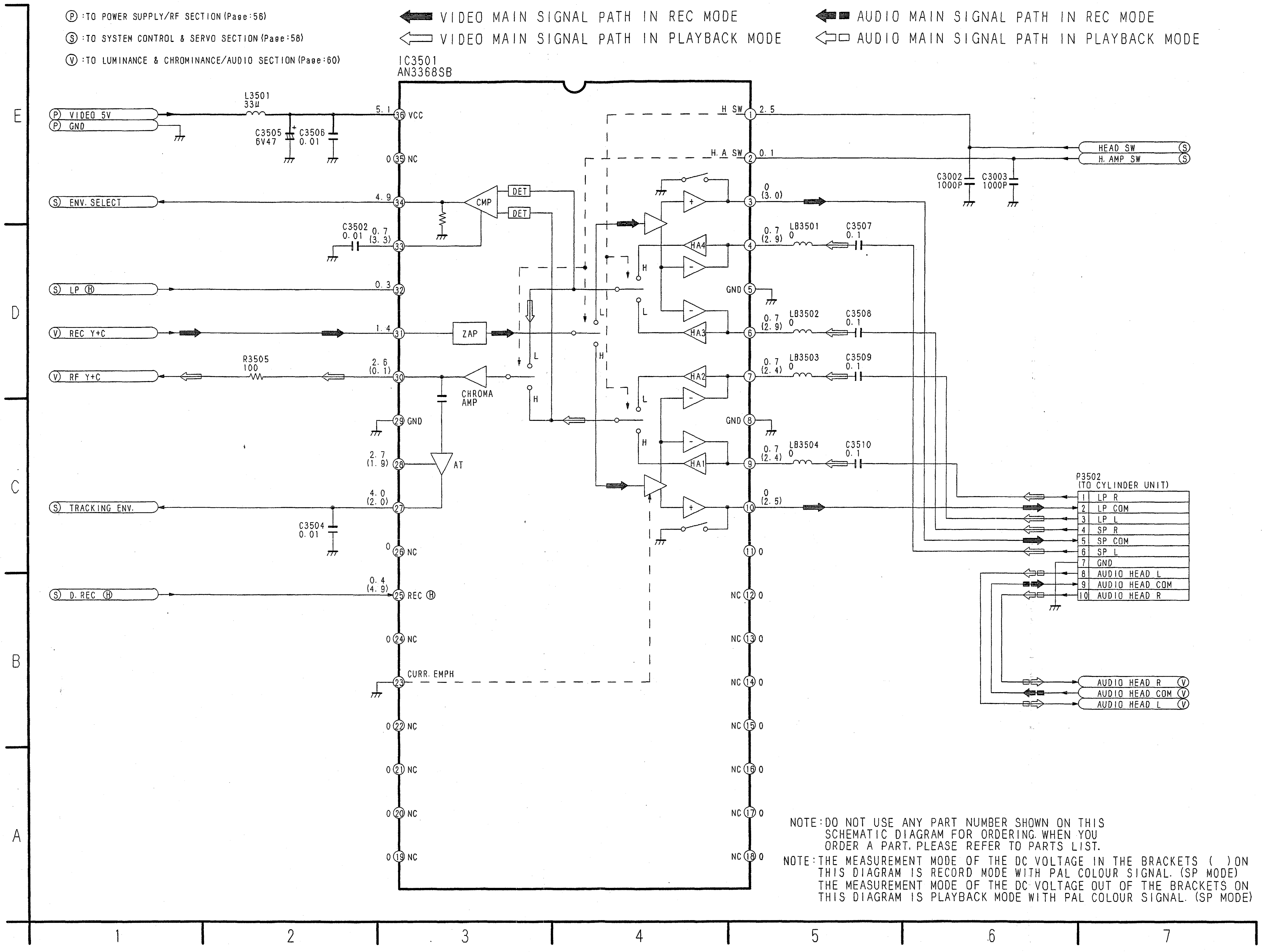
## 9.6. INPUT/OUTPUT SECTION IN MAIN SCHEMATIC DIAGRAM


Changed
MA165TA5VT
Added
Ⓟ :TO POWER SUPPLY/RF SECTION (Page:56)
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION (Page:58)
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION (Page:60)
Ⓣ :TO TIMER SECTION (Page:57)
VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE
G
F
E
D
C
B
A
Ⓟ PS 14V
Ⓟ PS 5V
Ⓟ VIDEO N. SW 5V
C4935 2200P
Ⓥ PROG. Ⓗ
Ⓥ AV2 PB Ⓗ
Ⓥ AUDIO IN2 (R)
Ⓥ AUDIO IN2 (L)
Ⓥ AUDIO OUT2 (L)
Ⓥ AUDIO OUT2 (R)
Ⓥ AUDIO IN1 (R)
Ⓥ AUDIO IN1 (L)
Ⓥ AUDIO OUT1 (L)
Ⓥ AUDIO OUT1 (R)
Ⓥ PROJ. 50
Ⓥ VIDEO OUT
(A12) (A11) (A10) (A9) (A8) (A7) (A6) (A5) (A4) (A3) (A2) (A1)
(A13) (A14) (A15) (A16) (A17) (A1)
L4904 68u
C4939 0.1
C4940 6V330
L4902 68u
C4925 0.1
C4928 6V330
D4902 MA165TA5VT
R4910 15K
R4935 10K
Ⓐ
R4932 470
R4934 1K
R4933 1K
Q4901 2SB709A (AMP)
2.2
0.8
C4941 0.1
C4917 0.1
D4901
C4923 0.1
C4932 0.1
2.2 2.0 11.3 (0) 0 0 0 0 1.8 5.1 2.0 0 1.8 0 4.9 2.2
GND
N. SW 5V
PS 5V
FSS OUT
6dB
SW1
SW3
CLAMP
SW2
AMP
BUF
IC4901 LA73021M
SERIAL CONTROL
POWER SAVE
IIC BUS INTERFACE
EXT CTL 4
EXT CTL 2
V REF
RIPPLE FLT
EXT CTL 3
EXT CTL 1
12V
0 4.6 4.8 0 1.2 (0.4) 2.2 6.2 1.6 (0) 11.0 1.9 11.9 0 0 3.5 1.9 1.5
Ⓓ
R4907 220
R4908 220
R4911 220
C4921 0.1
C4922 16V47
R4947 10M
Added
Ⓑ
C4926 16V47
C4929 0.1
Ⓢ SLEEP Ⓗ
Ⓥ TUNER VIDEO
Ⓣ FRONT VIDEO
(B1) (B3) (B7)
Ⓥ VIDEO IN
Ⓥ OSD IIC CLOCK
Ⓥ OSD IIC DATA
Ⓒ
Ⓟ PS 12V
L4903 68u
C4927 0.1
C4933 16V47
Ⓟ GND
Ⓟ GND (A)
R4931 10K
Added
LOE IR Ⓣ
LB4907 VLP0147
LB4906 VLP0147
C4914 220P
C4905 220P
TW4906
JK4903 VJS3634
R4902 330
R4901 330
C4904 470P
C4903 470P
C4901 47P
C4902 47P
L4901 0.22u
R4916 ~~330~~ 560
Changed
R4909 100K
R4928 75
R4929 75
Q4905 MSD1328 (RGB ON:ON)
R4912 4700
7.5
12.8
QR4903 MUN2212 (RGB OFF Ⓗ :ON)
3.5
C4944 1000p
Added
AV1 (TV)
1 AUDIO OUT (R)
2 AUDIO IN (R)
3 AUDIO OUT (L)
4 GND (A)
5 GND
6 AUDIO IN (L)
7 BLUE
8 PB +12V
9 GND
10 CONTROL
11 GREEN
12 ——
13 GND
14 GND
15 RED
16 BLANKING
17 GND
18 GND
19 VIDEO OUT
20 VIDEO IN
21 GND
TW4903 TW4907
LB4904 VLP0147
LB4903 VLP0147
C4906 470P
C4908 470P
TW4902 TW4901
R4923 330
R4921 330
C4907 470P
C4909 470P
C4912 47P
C4913 47P
R4915 22K
R4913 15K
TW3003 TW3002
R4924 75
R4925 75
AV2 (DECODER/EXT)
1 AUDIO OUT (R)
2 AUDIO IN (R)
3 AUDIO OUT (L)
4 GND (A)
5 GND
6 AUDIO IN (L)
7 BLUE
8 PB +12V
9 GND
10 IIC CLOCK
11 GREEN
12 IIC DATA
13 GND
14 GND
15 RED
16 BLANKING
17 GND
18 GND
19 VIDEO OUT
20 VIDEO IN
21 GND
R4927 47K
R4926 47K
Q4904 2SD601A (PROG Ⓗ :ON)
Q4903 2SD601A (PROG Ⓗ :ON)
3.3 4.8 2.9 4.6 0
D4906 MA4075NM
D4905 MA4075NM
JK4901 VJJ0377
C4911 220P
C4910 220P
LB4902 VLP0147
LB4901 VLP0147
AUDIO OUT (R)
AUDIO OUT (L)
1 2 3 4 5 6 7 8 9 10 11

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS( ) ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR. (SP MODE)
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL. (SP MODE)

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

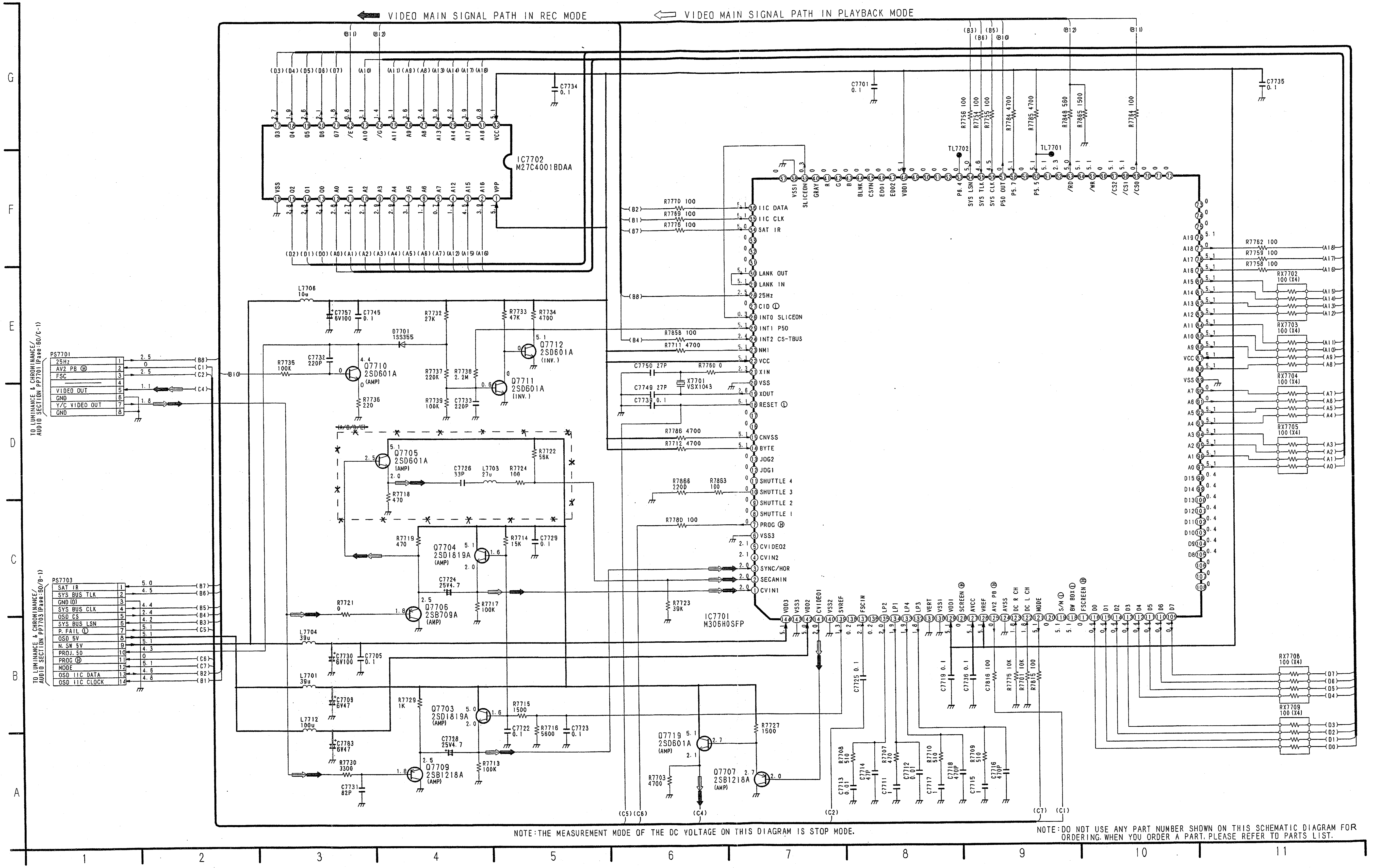
## 9.7. HEAD AMP SCHEMATIC DIAGRAM


Ⓟ :TO POWER SUPPLY/RF SECTION (Page:56)
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION (Page:58)
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION (Page:60)
VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE
IC3501
AN3368SB
Ⓟ VIDEO 5V
Ⓟ GND
L3501
33µ
C3505
6V47
C3506
0.01
5.1 36 VCC
0 35 NC
Ⓢ ENV. SELECT
4.9 34
CMP
DET
DET
C3502
0.01
0.7 (3.3) 33
Ⓢ LP Ⓗ
0.3 32
Ⓥ REC Y+C
1.4 31
ZAP
Ⓥ RF Y+C
R3505
100
2.6 (0.1) 30
CHROMA AMP
29 GND
2.7 (1.9) 28
AT
Ⓢ TRACKING ENV.
4.0 (2.0) 27
C3504
0.01
0 26 NC
Ⓢ D. REC Ⓗ
0.4 (4.9) 25 REC Ⓗ
0 24 NC
CURR. EMPH
23
0 22 NC
0 21 NC
0 20 NC
0 19 NC
H SW 1 2.5
H. A SW 2 0.1
0 (3.0) 3
HA4
0.7 (2.9) 0 4
LB3501
C3507
0.1
GND 5
HA3
0.7 (2.9) 0 6
LB3502
C3508
0.1
HA2
0.7 (2.4) 0 7
LB3503
C3509
0.1
GND 8
HA1
0.7 (2.4) 0 9
LB3504
C3510
0.1
0 (2.5) 10
11 0
NC 12 0
NC 13 0
NC 14 0
NC 15 0
NC 16 0
NC 17 0
NC 18 0
H
L
HEAD SW Ⓢ
H. AMP SW Ⓢ
C3002
1000P
C3003
1000P
P3502
(TO CYLINDER UNIT)
1 LP R
2 LP COM
3 LP L
4 SP R
5 SP COM
6 SP L
7 GND
8 AUDIO HEAD L
9 AUDIO HEAD COM
10 AUDIO HEAD R
AUDIO HEAD R Ⓥ
AUDIO HEAD COM Ⓥ
AUDIO HEAD L Ⓥ
E
D
C
B
A
1
2
3
4
5
6
7

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL. (SP MODE)
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL. (SP MODE)

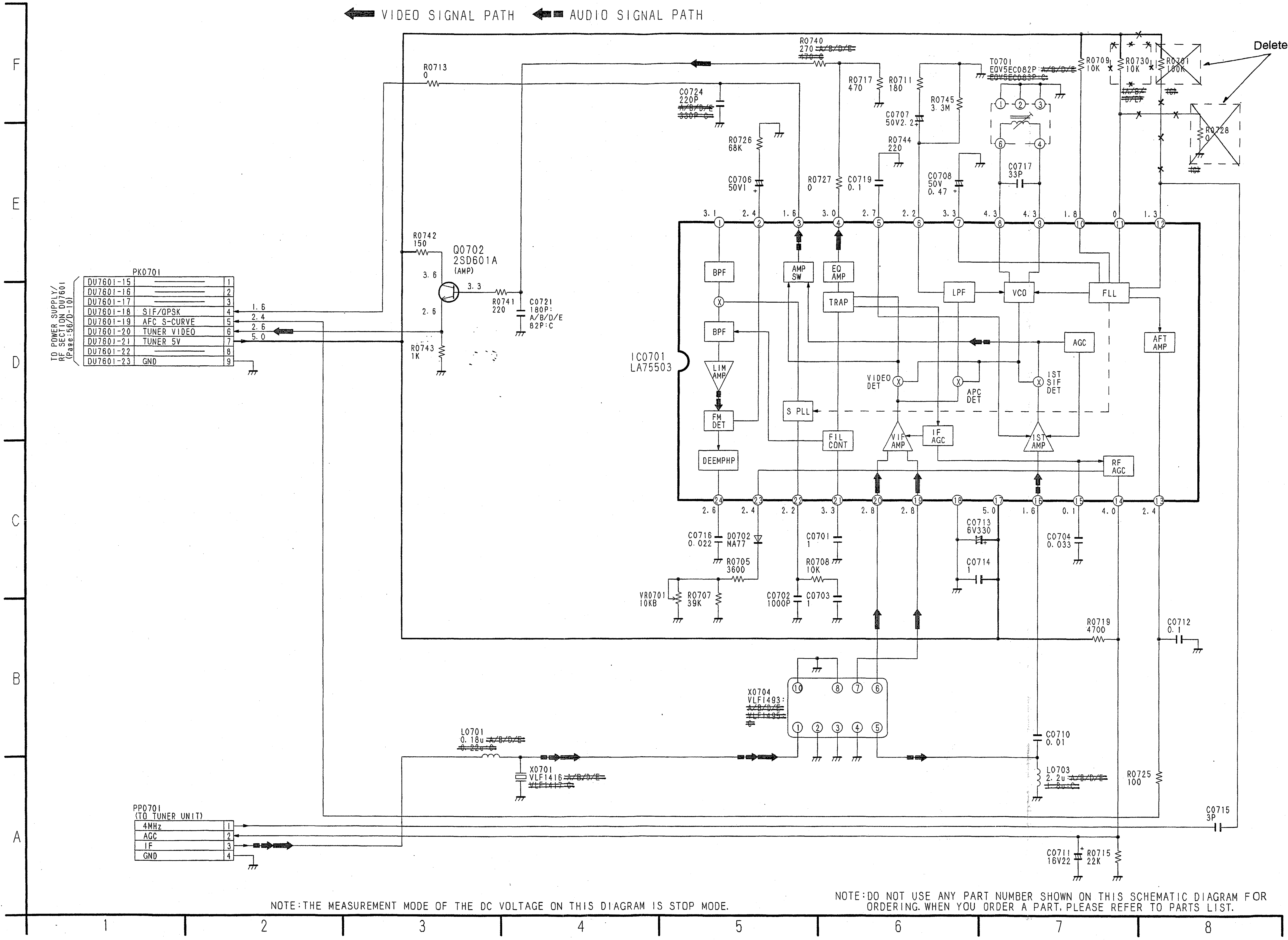
## 9.8. OSD PACK SCHEMATIC DIAGRAM


VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
IC7702
M27C4001BDAA
IC7701
M306H0SFP
C7734 0.1
C7701 0.1
C7735 0.1
TL7702
TL7701
PS7701
25Hz
AV2 PB Ⓗ
FSC
VIDEO OUT
GND
Y/C VIDEO OUT
GND
TO LUMINANCE & CHROMINANCE/ AUDIO SECTION PP7701 (Page 60/C-1)
PS7703
SAT IR
SYS BUS TLK
GND (D)
SYS BUS CLK
OSD CS
SYS BUS LSN
P. FAIL Ⓛ
OSD 5V
N. SW 5V
PROJ. 50
PROG Ⓗ
MODE
OSD IIC DATA
OSD IIC CLOCK
TO LUMINANCE & CHROMINANCE/ AUDIO SECTION PP7703 (Page 60/B-1)
Q7705 2SD601A (AMP)
Q7710 2SD601A (AMP)
Q7712 2SD601A (INV.)
Q7711 2SD601A (INV.)
Q7704 2SD1819A (AMP)
Q7706 2SB709A (AMP)
Q7703 2SD1819A (AMP)
Q7709 2SB1218A (AMP)
Q7719 2SD601A (AMP)
Q7707 2SB1218A (AMP)
D7701 1SS355
X7701 VSX1043
L7706 10u
L7703 27u
L7704 39u
L7701 39u
L7712 100u
RX7702 100 (X4)
RX7703 100 (X4)
RX7704 100 (X4)
RX7705 100 (X4)
RX7708 100 (X4)
RX7709 100 (X4)
IIC DATA
IIC CLK
SAT IR
LANK OUT
LANK IN
25Hz
CID Ⓛ
INT0 SLICEON
INT1 P50
INT2 CS-TBUS
NMI
VCC
XIN
VSS
XOUT
RESET Ⓛ
CNVSS
BYTE
JOG2
JOG1
SHUTTLE 4
SHUTTLE 3
SHUTTLE 2
SHUTTLE 1
PROG Ⓗ
VSS3
CVIDEO2
CVIN2
SYNC/HOR
SECAMIN
CVIN1
SLICEON
GRAY
BLNK
CSYN
ED01
ED02
VDD1
P6.4
SYS LSN
SYS CLK
P50 OUT
P5.7
P5.5
/RD
/WR
/CS2
/CS1
/CS0
VDD3
VSS3
VDD2
CVIDEO1
VSS2
SVREF
FSCIN
LP2
LP1
LP4
LP3
VERT
VSS1
VDD1
SCREEN Ⓗ
AVCC
VREF
AV2 PB Ⓗ
AVSS
DC R CH
DC L CH
MODE
S/M Ⓛ
BW BOX Ⓛ
FSCREEN Ⓗ
D0 D1 D2 D3 D4 D5 D6 D7
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19
D8 D9 D10 D11 D12 D13 D14 D15
G F E D C B A
1 2 3 4 5 6 7 8 9 10 11

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

## 9.9. TV DEMODULATOR PACK SCHEMATIC DIAGRAM

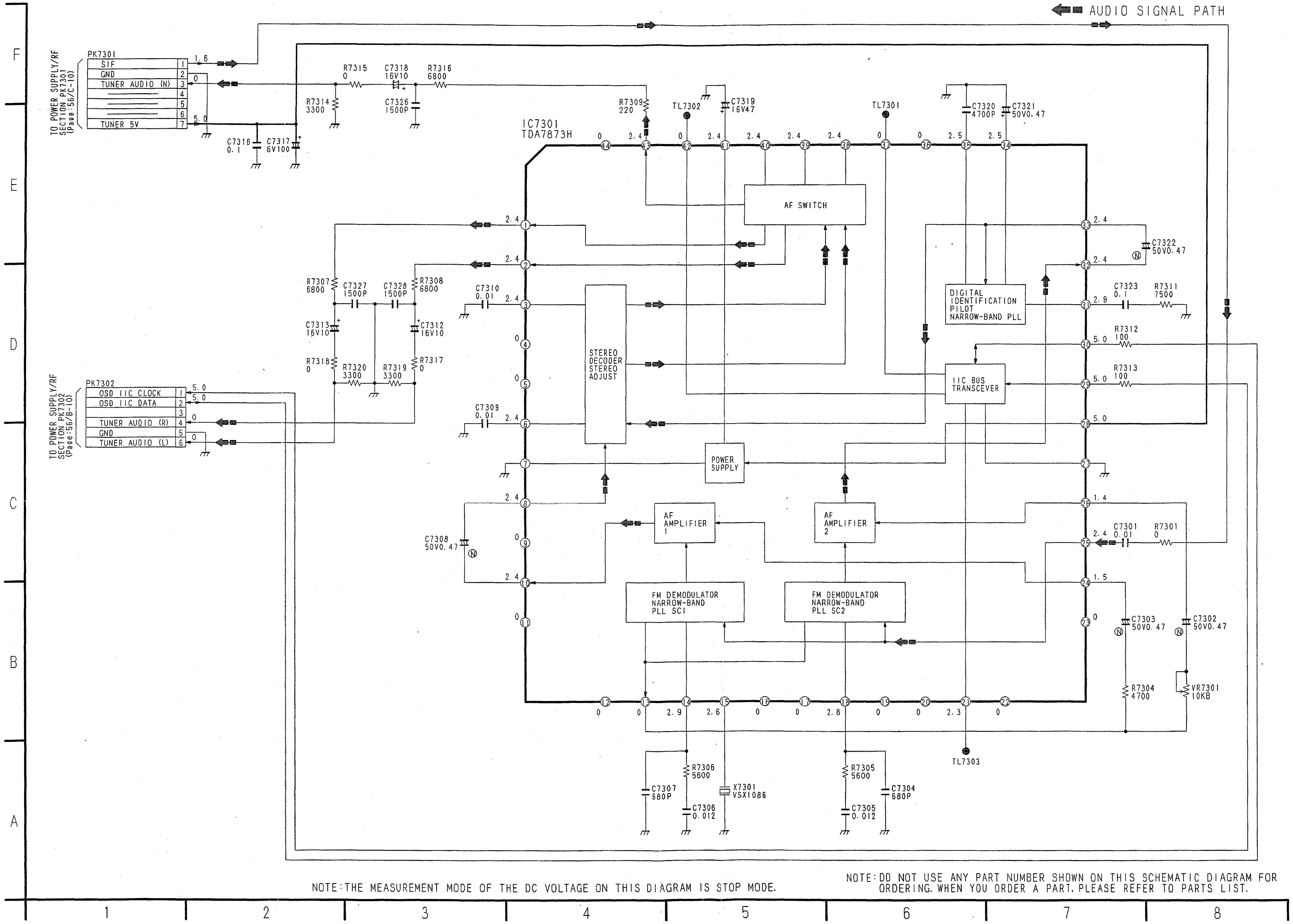


VIDEO SIGNAL PATH
AUDIO SIGNAL PATH
Deleted
F
E
D
C
B
A
1
2
3
4
5
6
7
8
TO POWER SUPPLY/ RF SECTION DU7601 (Page 56/D-10)
PK0701
DU7601-15 1
DU7601-16 2
DU7601-17 3
DU7601-18 SIF/QPSK 4
DU7601-19 AFC S-CURVE 5
DU7601-20 TUNER VIDEO 6
DU7601-21 TUNER 5V 7
DU7601-22 8
DU7601-23 GND 9
1.6
2.4
2.6
5.0
PP0701 (TO TUNER UNIT)
4MHz 1
AGC 2
IF 3
GND 4
R0713 0
R0742 150
Q0702 2SD601A (AMP)
3.6
3.3
2.6
R0741 220
C0721 180P: A/B/D/E 82P:C
R0743 1K
IC0701 LA75503
R0740 270 A/B/D/E 470:C
C0724 220P A/B/D/E 330P:C
R0726 68K
C0706 50V1
R0717 470
R0711 180
R0727 0
C0719 0.1
C0707 50V2.2
R0745 3.3M
R0744 220
C0708 50V 0.47
T0701 EQV5EC082P:A/B/D/E EQV5EC083P:C
C0717 33P
R0709 10K
R0730 10K
R0701 10K
A/B/E D/E/F
R0728 0
3.1
2.4
1.6
3.0
2.7
2.2
3.3
4.3
4.3
1.8
0
1.3
BPF
AMP SW
EQ AMP
TRAP
LPF
VCO
FLL
BPF
AGC
AFT AMP
LIM AMP
VIDEO DET
APC DET
1ST SIF DET
S PLL
FM DET
FIL CONT
VIF AMP
IF AGC
1ST AMP
DEEMPHP
RF AGC
2.6
2.4
2.2
3.3
2.8
2.8
5.0
1.6
0.1
4.0
2.4
C0716 0.022
D0702 MA77
R0705 3600
VR0701 10KB
R0707 39K
C0701 1
R0708 10K
C0702 1000P
C0703 1
C0713 6V330
C0714 1
C0704 0.033
R0719 4700
C0712 0.1
X0704 VLF1493: A/B/D/E VLF1495:C
L0701 0.18u A/B/D/E 0.22u:C
X0701 VLF1416 A/B/D/E VLF1417:C
C0710 0.01
L0703 2.2u A/B/D/E 1.8u:C
R0725 100
C0715 3P
C0711 16V22
R0715 22K

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

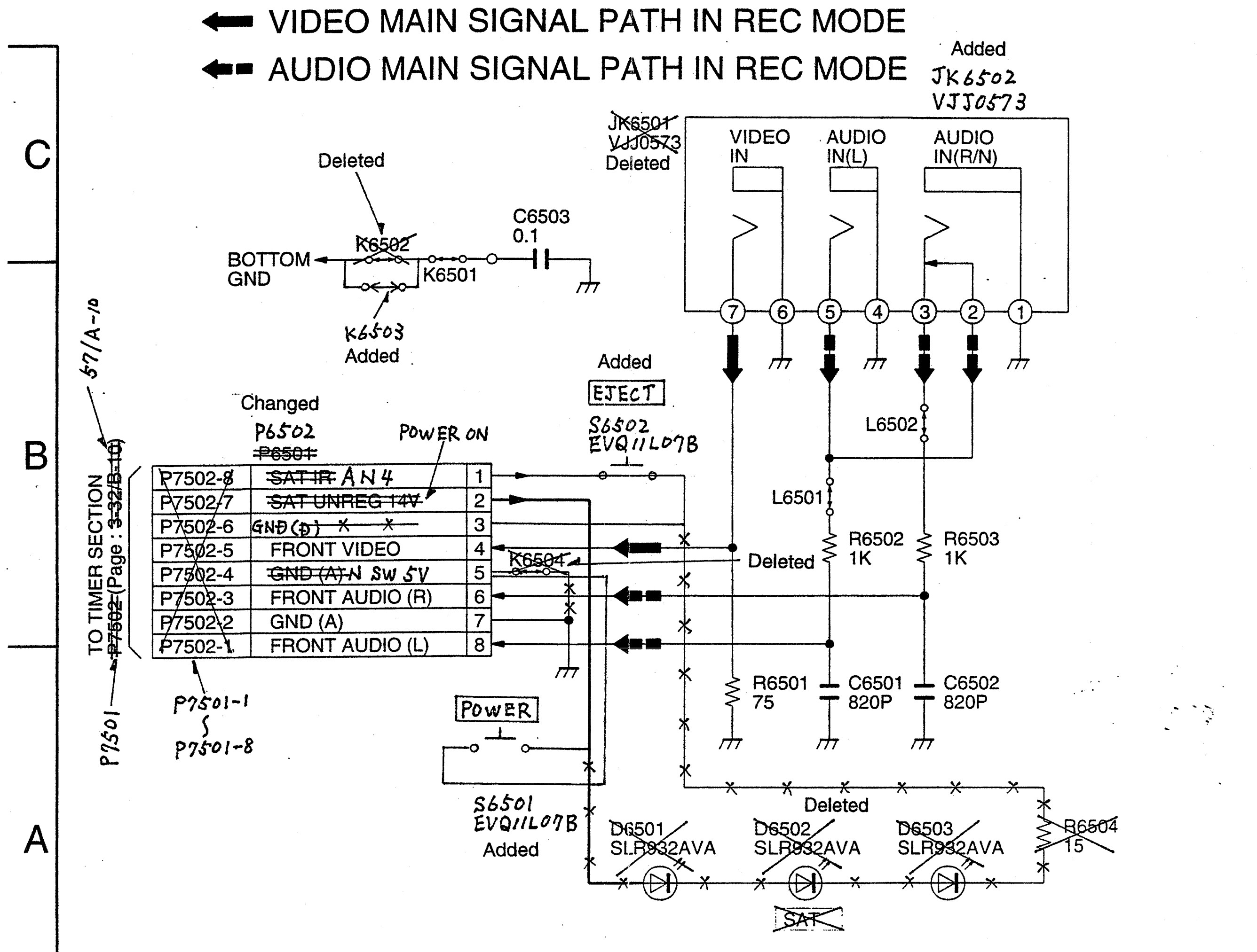
## 9.10. DECODER PACK SCHEMATIC DIAGRAM


AUDIO SIGNAL PATH
TO POWER SUPPLY/RF SECTION PK7301 (Page:56/C-10)
PK7301
SIF
GND
TUNER AUDIO (N)
TUNER 5V
TO POWER SUPPLY/RF SECTION PK7302 (Page:56/B-10)
PK7302
OSD IIC CLOCK
OSD IIC DATA
TUNER AUDIO (R)
GND
TUNER AUDIO (L)
IC7301
TDA7873H
AF SWITCH
STEREO DECODER STEREO ADJUST
DIGITAL IDENTIFICATION PILOT NARROW-BAND PLL
IIC BUS TRANSCEVER
POWER SUPPLY
AF AMPLIFIER 1
AF AMPLIFIER 2
FM DEMODULATOR NARROW-BAND PLL SC1
FM DEMODULATOR NARROW-BAND PLL SC2
R7315 0
C7318 16V10
R7316 6800
R7314 3300
C7326 1500P
C7316 0.1
C7317 6V100
R7309 220
TL7302
C7319 16V47
TL7301
C7320 4700P
C7321 50V0.47
C7322 50V0.47
C7323 0.1
R7311 7500
R7312 100
R7313 100
C7301 0.01
R7301 0
C7303 50V0.47
C7302 50V0.47
R7304 4700
VR7301 10KB
R7307 6800
C7327 1500P
C7328 1500P
R7308 6800
C7310 0.01
C7313 16V10
C7312 16V10
R7318 0
R7320 3300
R7319 3300
R7317 0
C7309 0.01
C7308 50V0.47
R7306 5600
C7307 680P
C7306 0.012
X7301 VSX1086
R7305 5600
C7304 680P
C7305 0.012
TL7303
F
E
D
C
B
A
1
2
3
4
5
6
7
8

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

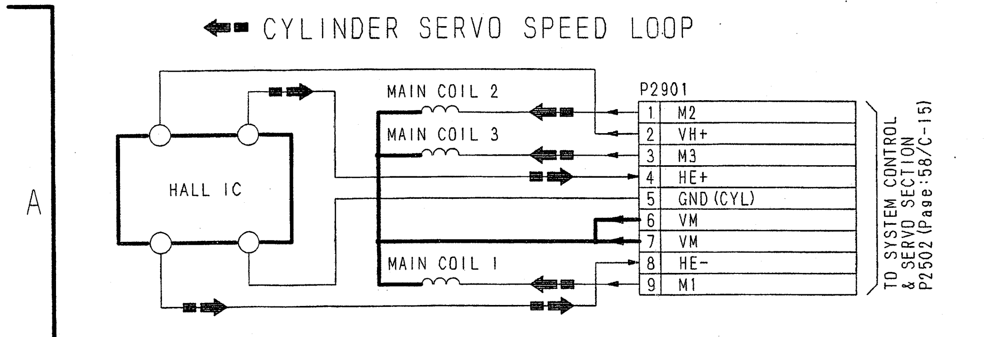
## 3-20. AV FRONT SCHEMATIC DIAGRAM


VIDEO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
Added
JK6502
VJJ0573
~~JK6501~~
~~VJJ0573~~
Deleted
VIDEO IN
AUDIO IN(L)
AUDIO IN(R/N)
Deleted
~~K6502~~
C6503
0.1
BOTTOM GND
K6501
K6503
Added
Added
EJECT
S6502
EVQ11L07B
L6502
Changed
P6502
~~P6501~~
POWER ON
57/A-10
TO TIMER SECTION ~~P7502~~ (Page: ~~3-32/B-10~~)
P7501
P7502-8 ~~SAT IR~~ AN4 1
P7502-7 ~~SAT UNREG 14V~~ 2
P7502-6 GND(D) 3
P7502-5 FRONT VIDEO 4
P7502-4 ~~GND (A)~~ N SW 5V 5
P7502-3 FRONT AUDIO (R) 6
P7502-2 GND (A) 7
P7502-1 FRONT AUDIO (L) 8
P7501-1
P7501-8
L6501
~~K6504~~
Deleted
R6502 1K
R6503 1K
R6501 75
C6501 820P
C6502 820P
POWER
S6501
EVQ11L07B
Added
Deleted
~~D6501~~ SLR932AVA
~~D6502~~ SLR932AVA
~~D6503~~ SLR932AVA
~~R6504~~ 15
~~SAT~~
C
B
A

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

1 2 3

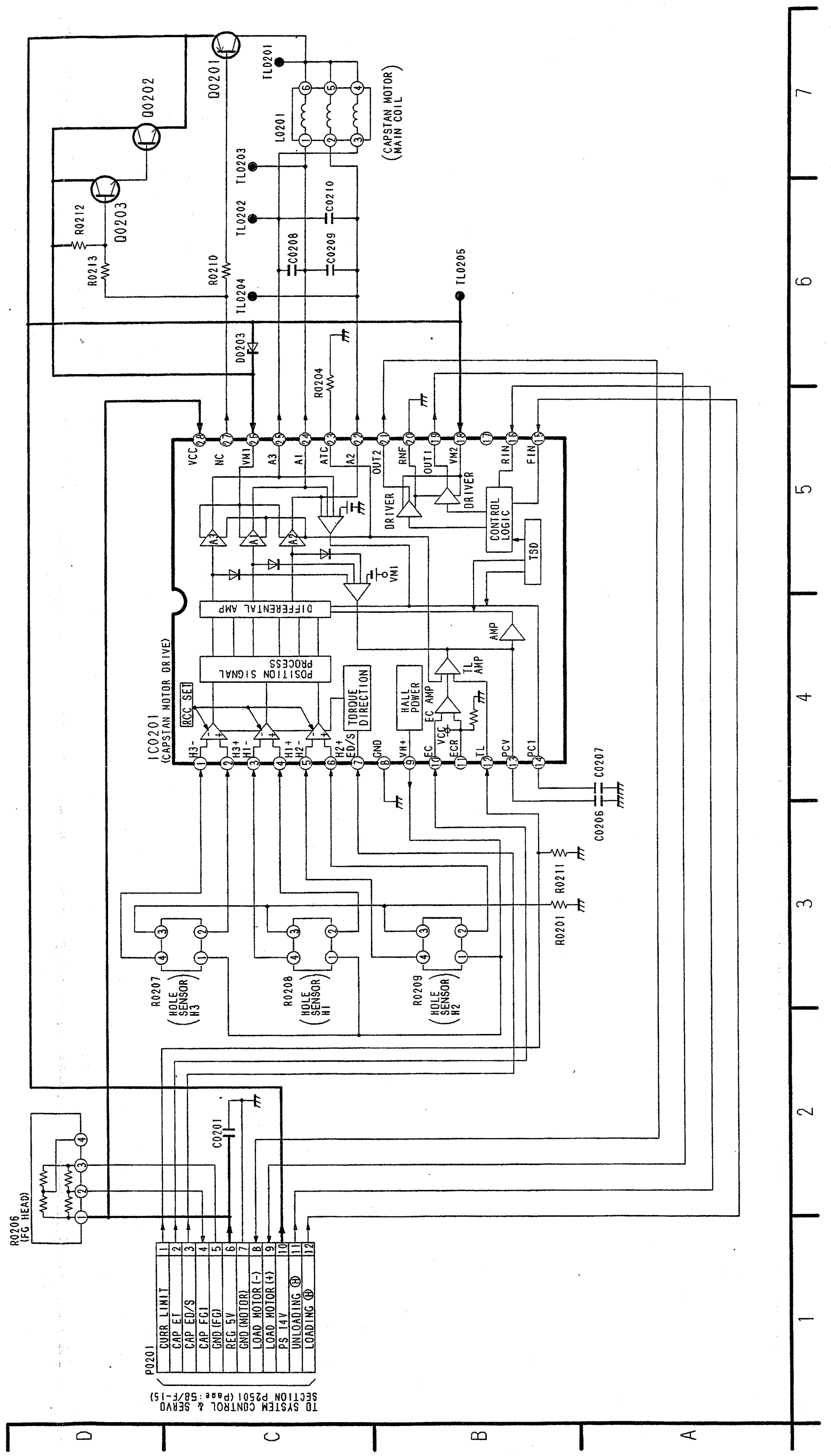
## 9.13. CYLINDER STATOR UNIT SCHEMATIC DIAGRAM


CYLINDER SERVO SPEED LOOP
MAIN COIL 2
MAIN COIL 3
MAIN COIL 1
HALL IC
P2901
1 M2
2 VH+
3 M3
4 HE+
5 GND (CYL)
6 VM
7 VM
8 HE-
9 M1
TO SYSTEM CONTROL & SERVO SECTION P2502 (Page:58/C-15)
A

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

1 2 3

## 9.14. CAPSTAN UNIT SCHEMATIC DIAGRAM


Q0201
Q0202
Q0203
R0212
R0213
R0210
R0204
D0203
L0201
TL0201
TL0202
TL0203
TL0204
TL0205
C0208
C0209
C0210
(CAPSTAN MOTOR MAIN COIL)
IC0201 (CAPSTAN MOTOR DRIVE)
DIFFERENTIAL AMP
POSITION SIGNAL PROCESS
TORQUE DIRECTION
HALL POWER
CONTROL LOGIC
TSD
DRIVER
C0206
C0207
R0211
R0201
R0207 HOLE SENSOR H3
R0208 HOLE SENSOR H1
R0209 HOLE SENSOR H2
R0206 (FG HEAD)
C0201
P0201
TO SYSTEM CONTROL & SERVO SECTION P2501 (Page:58/F-15)
D
C
B
A
1
2
3
4
5
6
7

# 10 CIRCUIT BOARD ASSEMBLIES

## 10.1. POWER C.B.A.

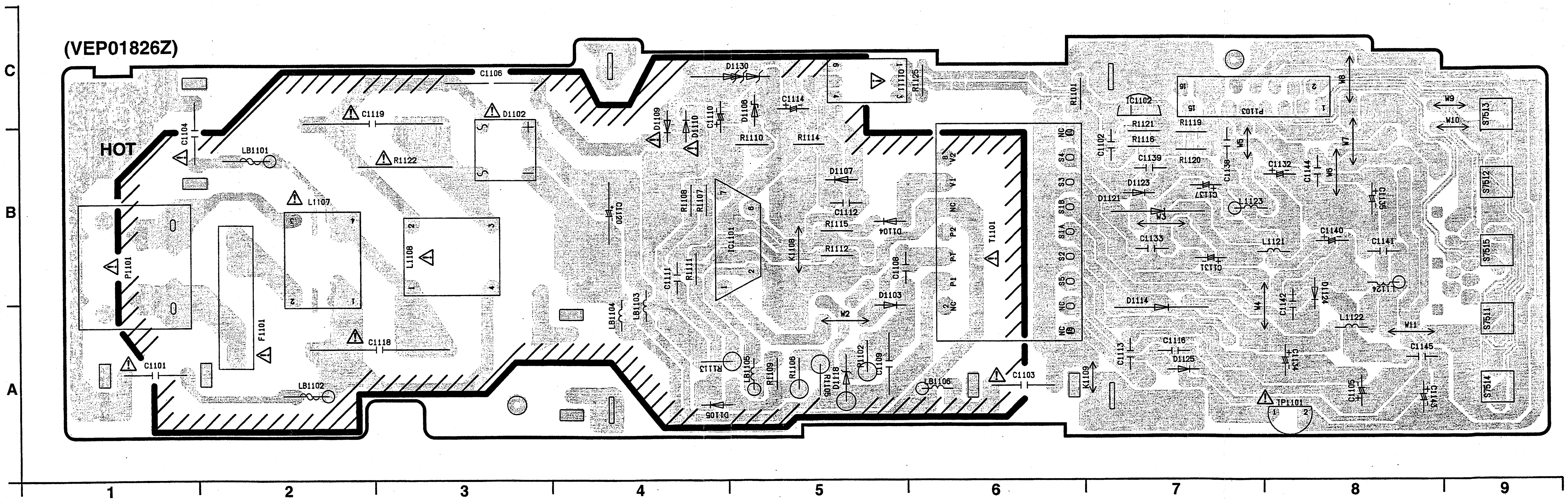
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

CAUTION

THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

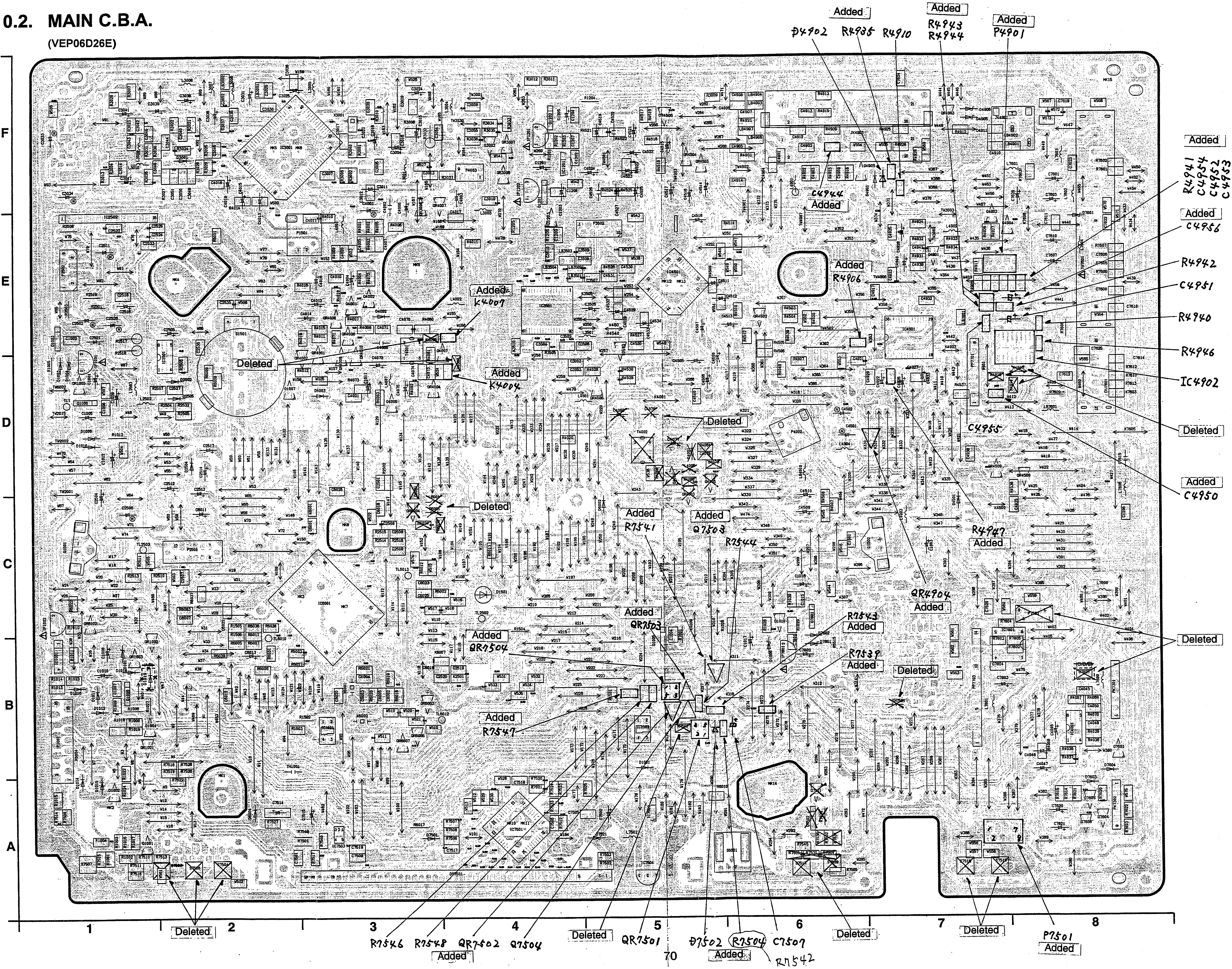
| POWER C.B.A. | |
|---|---|
| **Transistor** | |
| Q1111 | C-5 |
| **Integrated Circuit** | |
| IC1101 | B-5 |
| IC1102 | C-7 |
| **Connector** | |
| P1101 | B-1 |
| P1103 | C-7 |

ADDRESS INFORMATION


(VEP01826Z)
HOT
C
B
A
1
2
3
4
5
6
7
8
9
P1101
C1104
LB1101
C1119
R1122
D1102
L1107
F1101
L1108
C1118
C1101
LB1102
C1106
C1120
LB1104
LB1103
D1130
C1114
D1109
D1110
C1110
D1108
R1110
R1114
R1108
R1107
IC1101
K1108
C1111
R1111
D1107
C1112
R1115
D1104
R1112
C1108
D1103
W2
R1113
LB1105
R1109
R1106
D1118
C1109
LB1106
C1103
T1101
R1125
R1101
IC1102
P1103
R1121
R1116
R1119
C1139
R1120
D1123
D1121
W3
C1133
C1132
C1144
L1123
L1121
C1140
C1141
D1114
W4
C1142
L1122
W5
W6
W7
W8
W9
W10
W11
C1145
C1116
D1125
C1113
C1105
C1143
TP1101
S7513
S7512
S7515
S7511
S7514

## 10.2. MAIN C.B.A.

(VEP06D26E)

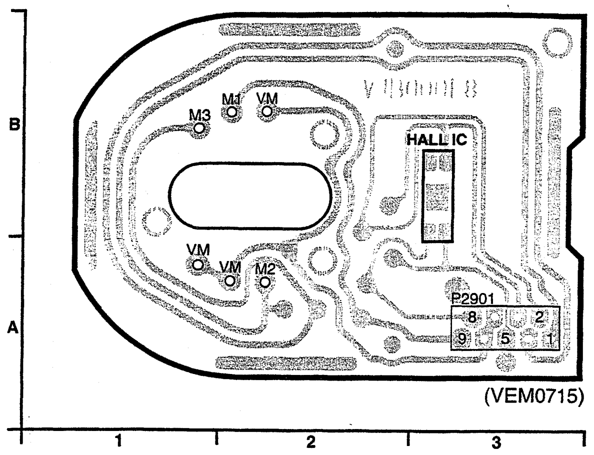

Added
D4902
R4935
R4910
Added
R4943
R4944
Added
P4901
Added
R4941
C4954
C4952
C4953
R4945
Added
C4956
R4942
C4951
R4940
R4946
IC4902
Deleted
Added
C4950
C4955
C4944
Added
Added
R4906
R4947
Added
QR4904
Added
Added
K4007
Deleted
Added
K4004
Deleted
Deleted
Added
R7541
Added
Q7503
R7544
Added
QR7503
R7543
Added
R7539
Added
Deleted
Added
QR7504
Added
R7547
Deleted
Deleted
Deleted
Deleted
Deleted
R7546
R7548
QR7502
Q7504
Added
QR7501
D7502
R7504
C7507
Added
R7542
P7501
Added
F
E
D
C
B
A
1
2
3
4
5
6
7
8

IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE

| MAIN C.B.A. | | | |
|---|---|---|---|
| **Transistor** | | **Integrated Circuit** | |
| Q1001 | A-1 | IC1001 | B-1 |
| Q1002 | A-1 | IC1201 | F-4 |
| Q1003 | E-1 | IC1501 | B-3 |
| Q1004 | B-1 | IC1502 | B-5 |
| Q1005 | B-5 | IC2501 | D-2 |
| Q1006 | D-1 | IC2502 | E-1 |
| Q1007 | D-2 | IC3001 | F-2 |
| Q1009 | B-1 | IC3501 | E-4 |
| Q1010 | C-6 | IC4001 | B-8 |
| Q1201 | F-4 | IC4501 | E-5 |
| Q1202 | F-4 | IC4901 | E-7 |
| Q1203 | E-4 | IC6001 | C-3 |
| Q1501 | C-1 | IC7501 | A-4 |
| Q1502 | C-7 | IC7502 | A-5 |
| Q3003 | F-4 | IC7503 | A-3 |
| Q4001 | E-3 | IC7504 | A-5 |
| Q4002 | E-3 | IC7801 | B-8 |
| Q4004 | D-5 | **Test Point** | |
| Q4005 | D-5 | TL1 | D-1 |
| Q4006 | D-3 | TL2502 | C-4 |
| Q4007 | E-4 | TL2503 | C-1 |
| Q4501 | E-5 | TL6010 | B-2 |
| Q4901 | E-7 | TL6012 | B-4 |
| Q4903 | E-7 | TL6013 | C-3 |
| Q4904 | E-8 | TW2001 | D-1 |
| Q4905 | F-6 | TW2002 | D-1 |
| Q7501 | A-6 | TW2015 | D-1 |
| Q7502 | A-6 | TW3001 | F-4 |
| Q7601 | B-8 | TW3002 | E-7 |
| Q7604 | A-8 | TW3003 | E-7 |
| Q7605 | A-8 | TW3030 | F-4 |
| Q7606 | A-8 | TW4501 | F-5 |
| Q7801 | C-6 | TW4502 | E-6 |
| **Transistor & Resistor** | | TW4901 | F-6 |
| QR1001 | B-1 | TW4902 | F-6 |
| QR1002 | B-1 | TW4903 | F-5 |
| QR1003 | B-1 | TW4906 | E-7 |
| QR1005 | D-1 | TW4907 | E-6 |
| QR3006 | F-4 | TW6002 | D-1 |
| QR3007 | F-4 | **Connector** | |
| QR3008 | F-3 | P1001 | B-1 |
| QR4001 | D-3 | P1501 | E-3 |
| QR4002 | D-3 | P2501 | D-2 |
| QR4003 | C-5 | P2502 | E-1 |
| QR4004 | D-3 | P3502 | E-5 |
| QR4006 | E-3 | P4002 | D-6 |
| QR4007 | F-4 | P4003 | F-4 |
| QR4008 | E-3 | P7502 | C-8 |
| QR4009 | D-3 | DU7601 | D-8 |
| QR4010 | D-3 | PK7301 | B-8 |
| QR4502 | E-6 | PK7302 | A-8 |
| QR4503 | F-5 | PP7701 | D-7 |
| QR4504 | F-5 | PP7703 | B-7 |
| QR4505 | F-5 | TU7601 | E-8 |
| QR4506 | D-5 | | |
| QR4508 | D-8 | | |
| QR4509 | D-7 | | |
| QR4903 | F-7 | | |
| QR6002 | C-1 | | |
| QR6003 | B-3 | | |
| QR6004 | C-3 | | |
| QR6006 | B-3 | | |
| QR6007 | B-3 | | |

ADDRESS INFORMATION

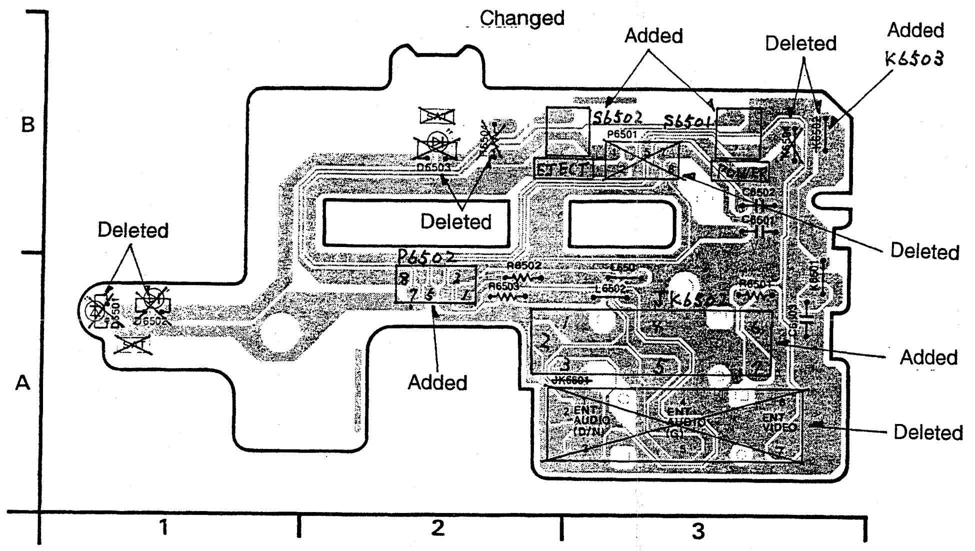
## 10.3. CYLINDER STATOR UNIT


B
A
M3
M1
VM
HALL IC
VM
VM
M2
P2901
8
2
9
5
1
(VEM0715)
1
2
3

| CYLINDER STATOR UNIT | |
|---|---|
| **Integrated Circuit** | |
| HALL IC | B-3 |
| **Connector** | |
| P2901 | A-3 |

ADDRESS INFORMATION

## 3-33. AV FRONT C.B.A. (VEP06C31D)


Changed
Added
Deleted
Added
K6503
B
S6502
S6501
P6501
EJECT
POWER
D6503
C6502
C6501
Deleted
Deleted
P6502
R6502
R6503
L6502
R6501
JK6502
D6501
D6502
Deleted
Added
Added
A
JK6501
ENT AUDIO (D/N)
ENT AUDIO (G)
ENT VIDEO
Deleted
1
2
3

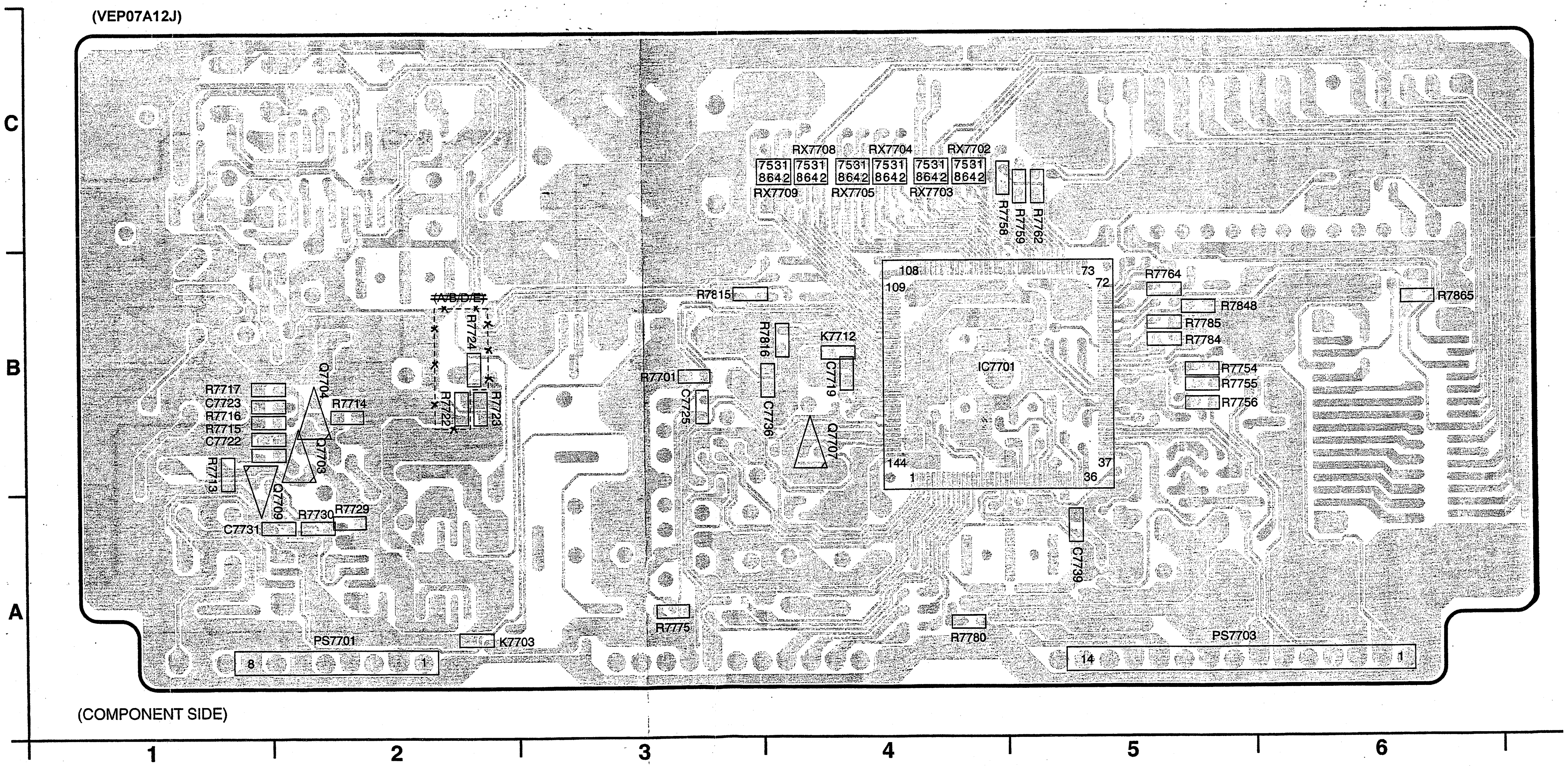
| AV FRONT C.B.A. | |
|---|---|
| **Connector** | |
| ~~P6501~~ | ~~B-3~~ |

ADDRESS INFORMATION

P6502 A-2

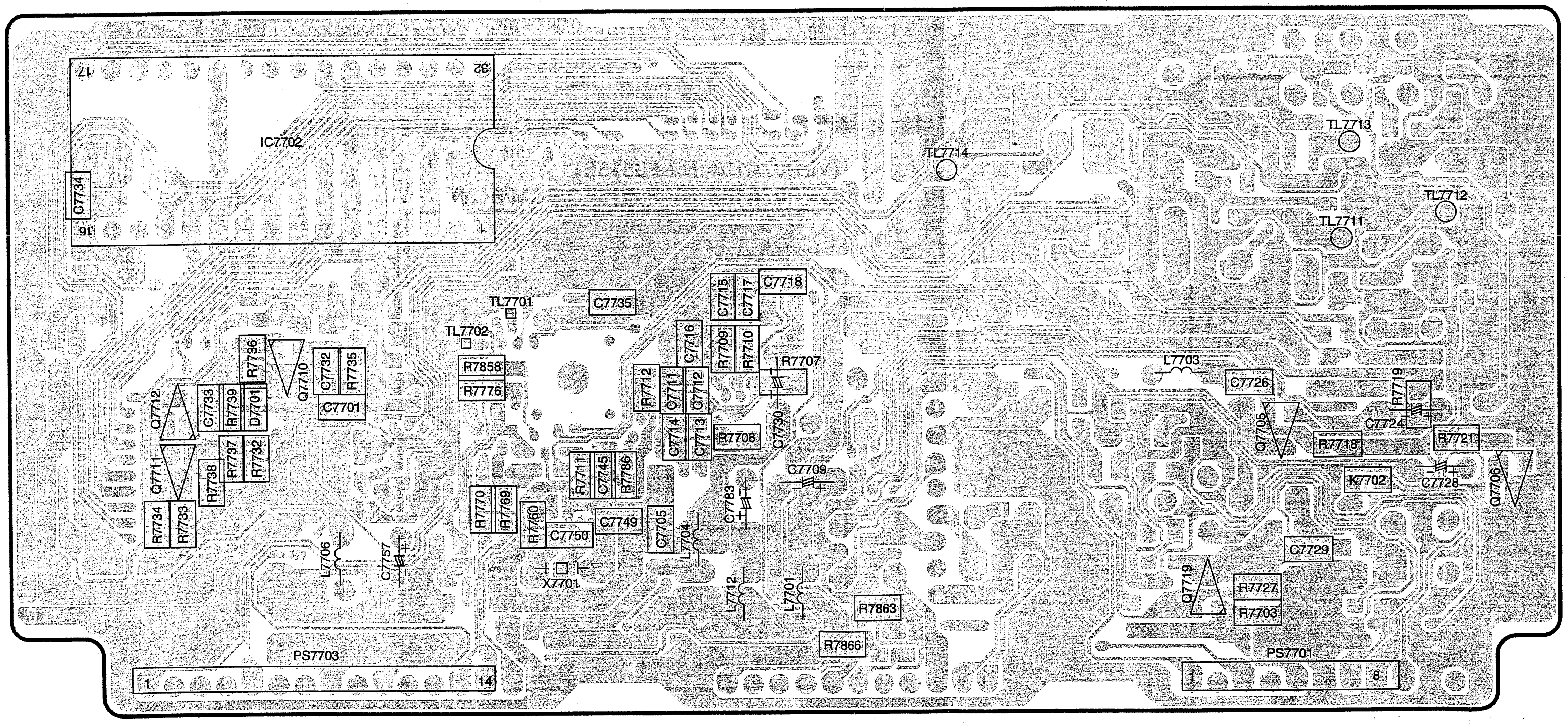
Changed

## 10.5. OSD PACK C.B.A.


(VEP07A12J)
C
B
A
RX7708
RX7704
RX7702
7531 8642
RX7709
RX7705
RX7703
R7758
R7759
R7762
108
73
109
72
IC7701
144
1
36
37
R7764
R7848
R7785
R7784
R7754
R7755
R7756
R7865
R7815
R7816
K7712
C7719
Q7701
R7701
C7725
C7736
(A/B/D/E)
R7724
R7722
R7723
Q7704
R7717
C7723
R7716
R7715
C7722
R7714
Q7703
R7713
Q7709
C7731
R7730
R7729
C7739
R7775
R7780
PS7701
8
1
K7703
PS7703
14
1
(COMPONENT SIDE)
1
2
3
4
5
6

| OSD PACK C.B.A. | | | |
|---|---|---|---|
| **Transistor** | | **Test Point** | |
| Q7703 | B-2 | TL7701 | B-9 |
| Q7704 | B-2 | TL7702 | B-9 |
| Q7705 | B-12 | TL7711 | C-12 |
| Q7706 | B-12 | TL7712 | C-12 |
| Q7707 | B-4 | TL7713 | C-12 |
| Q7709 | A-1 | TL7714 | C-10 |
| Q7710 | B-8 | **Connector** | |
| Q7711 | B-7 | PS7701 | A-2 |
| Q7712 | B-7 | PS7701 | A-12 |
| Q7719 | A-11 | PS7703 | A-5 |
| **Integrated Circuit** | | PS7703 | A-8 |
| IC7701 | B-4 | | |
| IC7702 | C-8 | | |

ADDRESS INFORMATION


IC7702
32
17
16
1
C7734
TL7714
TL7713
TL7712
TL7711
TL7701
TL7702
C7735
C7718
C7715
C7717
C7716
R7709
R7710
R7707
R7712
C7711
C7712
C7714
C7713
R7708
C7730
C7709
C7783
R7858
R7776
Q7712
Q7711
Q7710
C7733
R7739
D7701
R7736
C7732
R7735
C7701
R7737
R7732
R7738
R7734
R7733
L7706
C7757
R7770
R7769
R7780
C7750
X7701
R7711
C7745
R7786
C7749
C7705
L7704
L7712
L7701
R7863
R7866
PS7703
1
14
L7703
C7726
R7719
C7724
Q7705
R7718
R7721
K7702
C7728
Q7706
C7729
Q7719
R7727
R7703
PS7701
1
8

(FOIL SIDE)

7
8
9
10
11
12

## 10.6. TV DEMODULATOR PACK C.B.A.

| TV DEMODULATOR PACK C.B.A. | |
|---|---|
| **Transistor** | |
| Q0702 | A-3 |
| **Integrated Circuit** | |
| IC0701 | C-2 |
| **Adjustment** | |
| T0701 | B-3 |
| VR0701 | D-2 |
| **Connector** | |
| PK0701 | A-2 |
| PP0701 | B-1 |

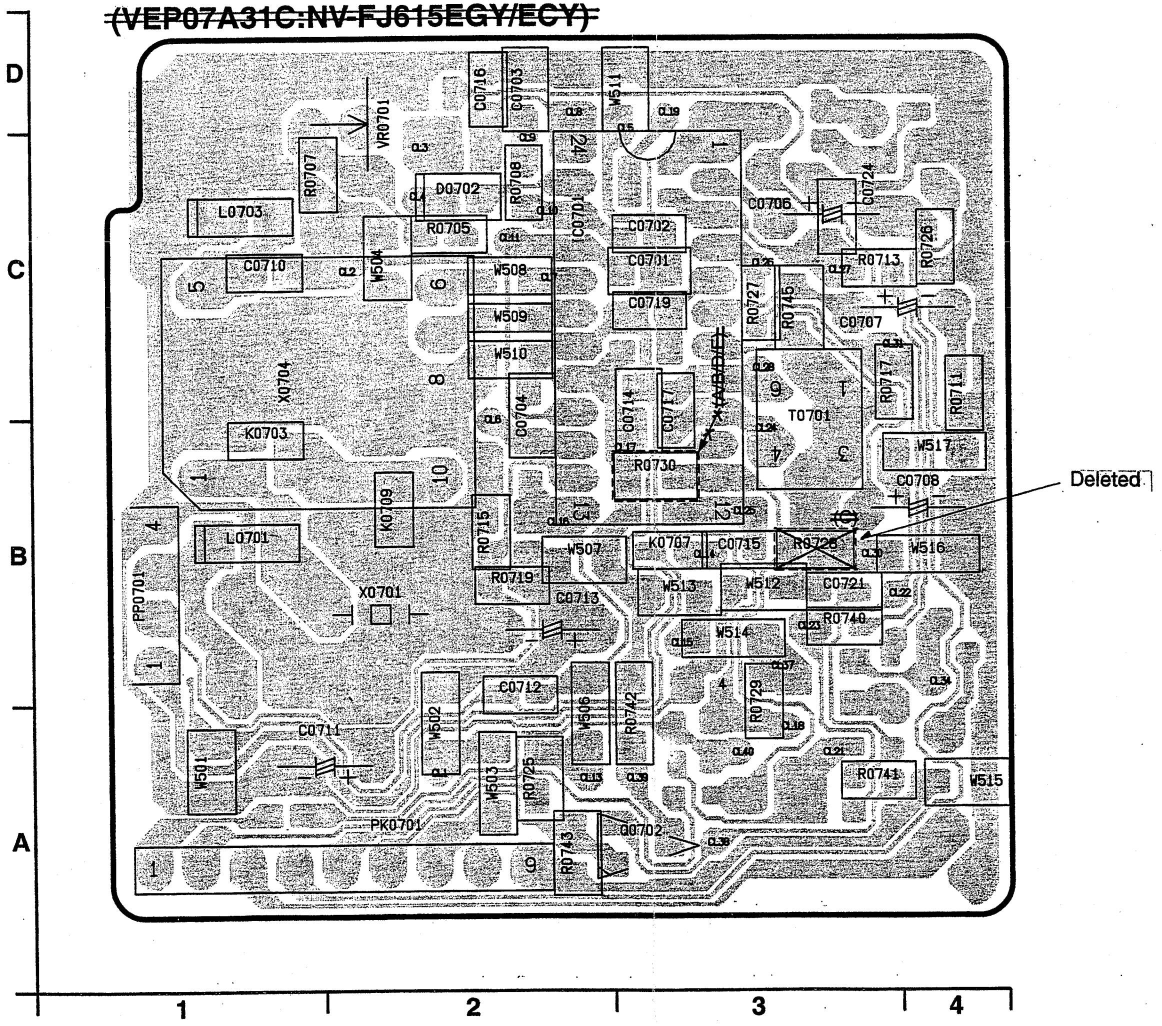
ADDRESS INFORMATION

(VEP07A23A)

~~(VEP07A23A:NV-FJ615EG/EC/ECM)~~

~~(VEP07A23B:NV-FJ615B)~~

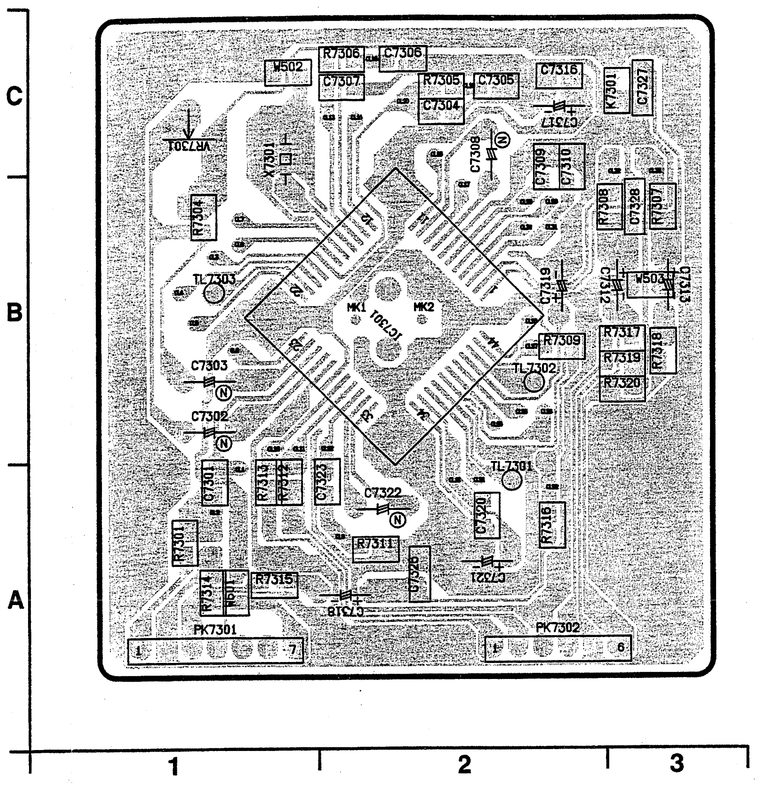
~~(VEP07A31C:NV-FJ615EGY/ECY)~~



D
C
B
A
1
2
3
4
Deleted
L0703
C0710
X0704
K0703
L0701
X0701
PP0701
C0711
W501
PK0701
VR0701
R0707
D0702
R0705
W504
R0708
C0716
C0703
W511
IC0701
W508
W509
W510
C0704
C0702
C0701
C0719
C0714
C0717
R0730
K0709
R0715
R0719
W507
C0713
K0707
C0715
R0726
W513
W512
C0721
R0740
W514
C0712
W506
R0742
R0729
W502
W503
R0725
R0743
Q0702
R0741
W515
C0706
C0724
R0713
R0728
R0727
R0745
C0707
T0701
R0717
R0711
W517
C0708
W516

## 10.7. DECODER PACK C.B.A.

(VEP07A23A)



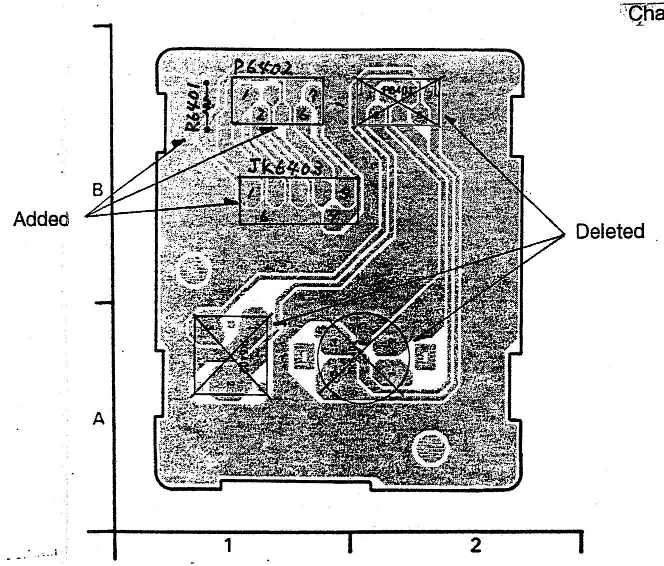
C
B
A
1
2
3
W502
R7306
C7306
C7307
R7305
C7305
C7304
C7316
X7301
C7327
VR7301
X7301
C7308
C7309
C7310
R7304
R7308
C7328
R7307
TL7303
C7319
C7312
W503
C7313
IC7301
MK1
MK2
C7303
R7309
R7317
R7319
R7318
TL7302
R7320
C7302
TL7301
R7313
C7323
C7322
C7320
R7316
R7301
R7311
C7326
C7321
R7314
R7315
PK7301
PK7302

| DECODER PACK C.B.A. | |
|---|---|
| **Integrated Circuit** | |
| IC7301 | B-2 |
| **Test Point** | |
| TL7301 | A-2 |
| TL7302 | B-2 |
| TL7303 | B-1 |
| **Adjustment** | |
| VR7301 | C-1 |
| **Connector** | |
| PK7301 | A-1 |
| PK7302 | A-2 |

ADDRESS INFORMATION

## 3-34. READ EDIT C.B.A. (VEP06C48C)

Changed



B
A
1
2
Added
Deleted
P6402
R6401
JK6403
P6401

| REAR EDIT C.B.A. | |
|---|---|
| **Connector** | |
| ~~P6401~~ | ~~B-2~~ |

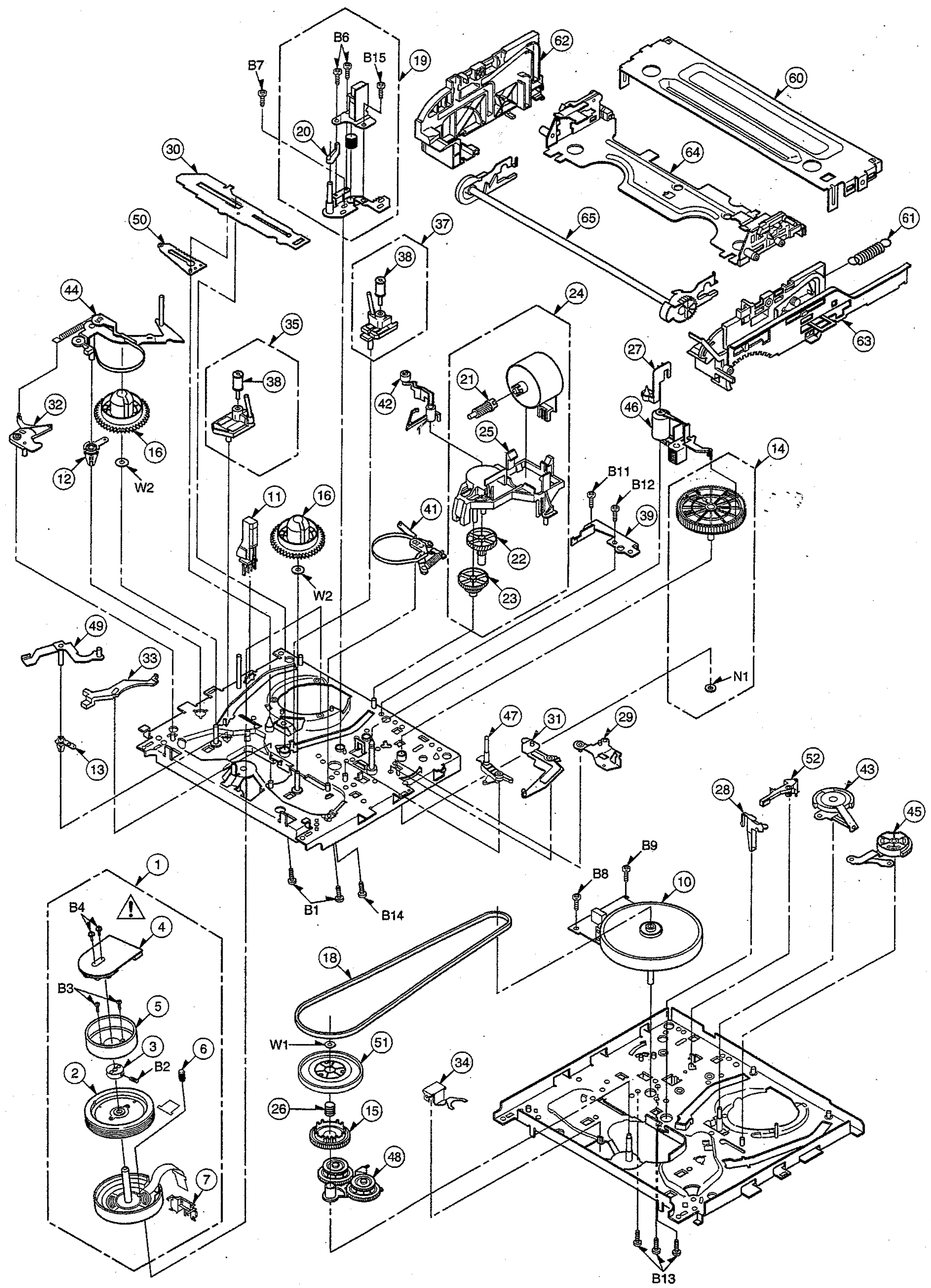
ADDRESS INFORMATION

P6402 B-1

Changed

# 11 EXPLODED VIEWS & MECHANICAL REPLACEMENT PARTS LIST

## 11.1. CHASSIS PARTS SECTION


B6
B7
B15
19
20
62
60
64
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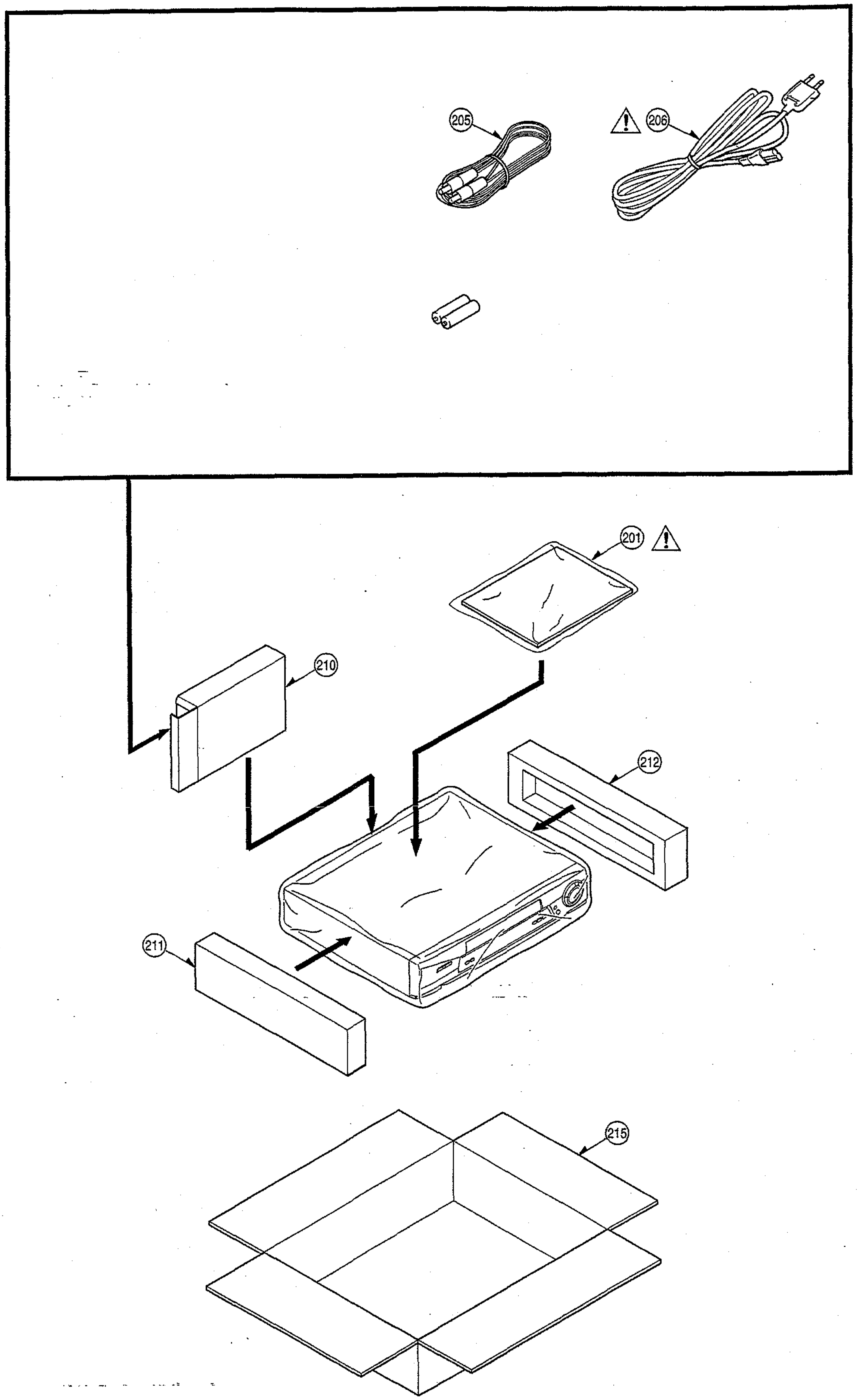
50
65
61
37
38
44
24
35
38
27
63
21
42
46
32
16
25
12
W2
14
B11
B12
11
16
41
39
22
W2
23
49
33
N1
47
31
29
13
52
43
28
45
B9
1
B8
10
B4
4
B1
B14
18
B3
5
3
6
W1
51
34
2
B2
26
15
48
7
B13

## 11.3. PACKING PARTS SECTION


205
206
201
210
212
211
215

ORDER NO. VRD9802005C2

# Service Manual

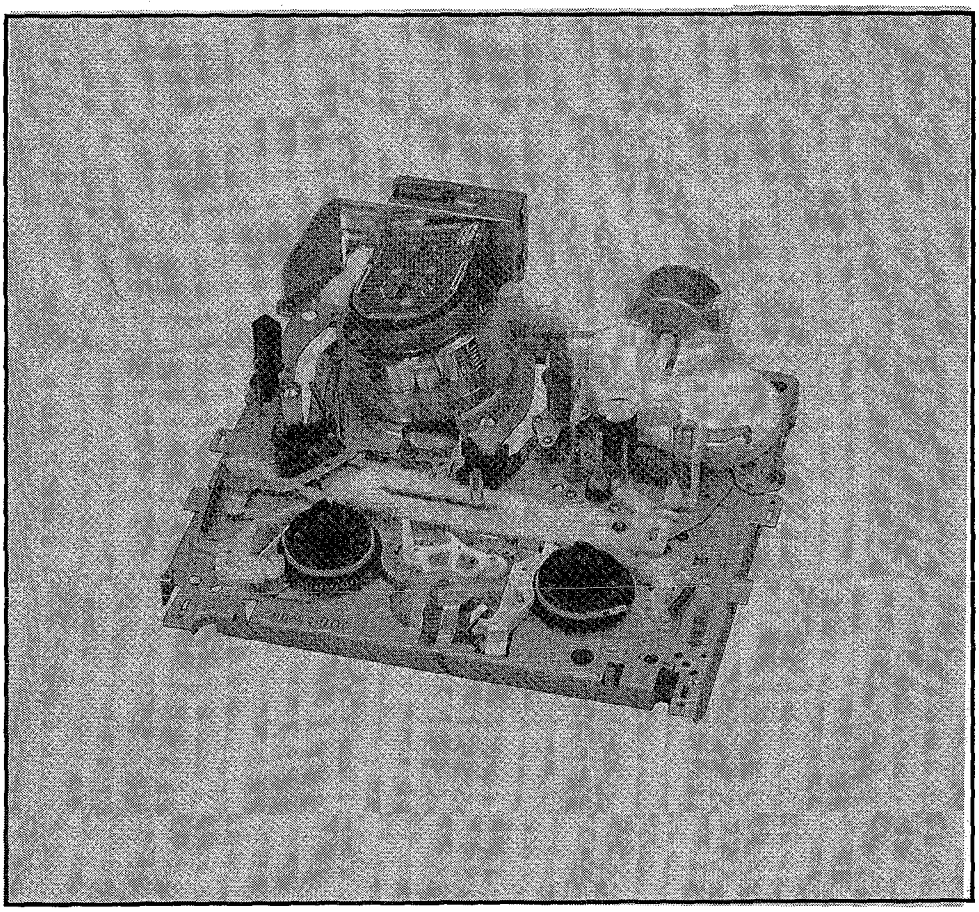
Video Cassette Recorder

**Panasonic** VHS

V20682

## Z-MECHANISM CHASSIS

## REV-1



### INTRODUCTION

The Z-Mechanism chassis are built in several Panasonic VHS Video Cassette Recorders from NV-SD and NV-HD series in 1998.

### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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**Panasonic**

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# 1. OUTLINE OF Z MECHANISM

## 1-1. The tape transport path

(1) Mechanism Chassis

Aluminium Chassis has been changed to sheet metal (Thickness: 1.2 mm).

(2) Capstan position (Cassette-in method/Capstan-in method)

The Tape does not touch the Cassette tape so that the rationalization has been promoted such as Reel gear pinch up/down mechanism has been deleted.

(3) Deletion of P1 post

FE Head has been installed Limiter so that P1 post has been deleted.

(4) A/C Head base combined with P4 post

A/C Head has been combined with P4 post on the same base.

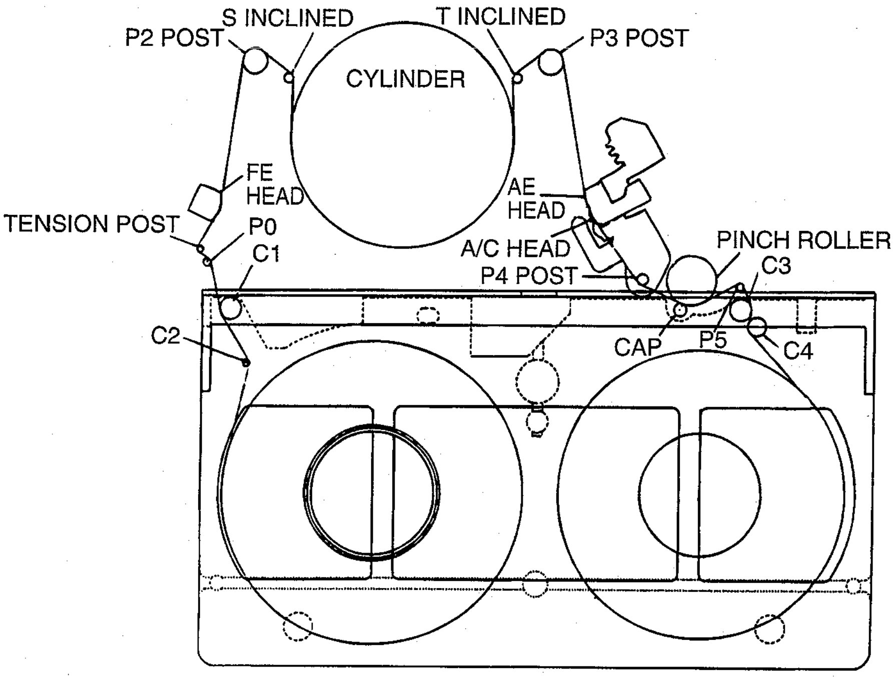
(5) Change of A/C head base type

The change of the angle winding the tape on A/C head has been reduced by the construction of A/C head base has been changed from the revolution type to slide base type.

(6) Improvement of P5 post

P5 post operation has been changed by non-adjustable of the Height and the Tilt adjustment so that the specification has been improved.

Z Mechanism tape transport path in REV mode


S INCLINED
T INCLINED
P2 POST
P3 POST
CYLINDER
FE
HEAD
AE
HEAD
TENSION POST
P0
C1
A/C HEAD
PINCH ROLLER
C3
P4 POST
C2
CAP
P5
C4

## 1-2. Cassette holder unit

(1) Cassette-in operation

The Rack drive arm drives Main Cam gear by inserting the cassette tape. Consequently, Position switch detects the cassette-in mode so that Loading motor drives. The mode goes to the Stop mode from the Cassette-in through the Loading mode.

① The parts quantity reduction of Cassette holder unit.

(Z Mechanism: 21 pieces, K Mechanism: 36 pieces)

a. Release lever has been installed in Right Side Plate.

b. Cassette guide has been installed in Front Panel unit.

c. Safety lever spring is made by the resin.

d. Opener lever has been changed into the single opener type.

e. One side of Side Plate unit is hung on Chassis in order to fix it.

② Improvement of the cassette insertion

(The force of the cassette insertion Z Mechanism: Approximately 400gm.,
K Mechanism: Approximately 600gm.)

The tooth pitch of Worm gear which has been extended against the previous model, is located on the Motor so that Worm gear can be reversed. Consequently, the Motor rotates before the insertion spring (the combined spring) is working when the cassette tape is inserted, so that the repelled force of the insertion spring has been reduced as differing from the present model.

③ Small-sized Cassette holder unit (Thinned unit)

a. The Wiper arm method which has been adopted, assigned Wiper arm between Cassette Holder Plate and Side Plate so that the small-sized of the width has been realized.

b. To prevent the increment of parts quantity such as Safety lever is used for Pre-open mechanism shown in the present model, and the small-sized unit has been realized by inclining one portion of the L groove in Side Plate.

c. The part of driving change-over is located in the nearest to the center of Reel so that the depth size is compacter.

## 1-3. Reel brake

(1) Supply Reel Brake is used for Tension Regulator which is composed of the conventional Main brake and the soft brake function.

(2) Take-up Reel Brake is used as Band Brake unit in order to correspond with Supply Reel Brake.

※ Tension Regulator performance:

This is composed of Tension regulator and brake. The tape always is given the tension against the advance direction by Tension band.

(3) Construction of Supply reel tension regulator

Comparison of the construction with the conventional model

|  | Z Mechanism | K Mechanism |
|---|---|---|
| Tension Arm Shaft Bearing construction | Resin | Tension arm |
| Tension Band | Felt less Lumiller | Felt Lumiller |
| Braking method | Tension regulator | Main & soft brake |

Operating mode and necessary function

| Mechanism mode | Necessary function | Operation |
|---|---|---|
| Cassette down | Prevention of the tape slag (Soft brake) | Soft brake |
| Completion of Loading | Prevention of the tape slag (Soft brake) | Tension regulator |
| REV | Prevention of in Play mode to REV mode (Soft brake) | Tension regulator |
| PLAY, FF | Back tension adjustment | Same as the conventional |
| STOP | Main brake function | Tension regulator |

(4) Construction of Take-up brake

Take-up brake is used Band brake as well as Supply brake depend on corresponding with Band brake is adopted at the Supply Side.

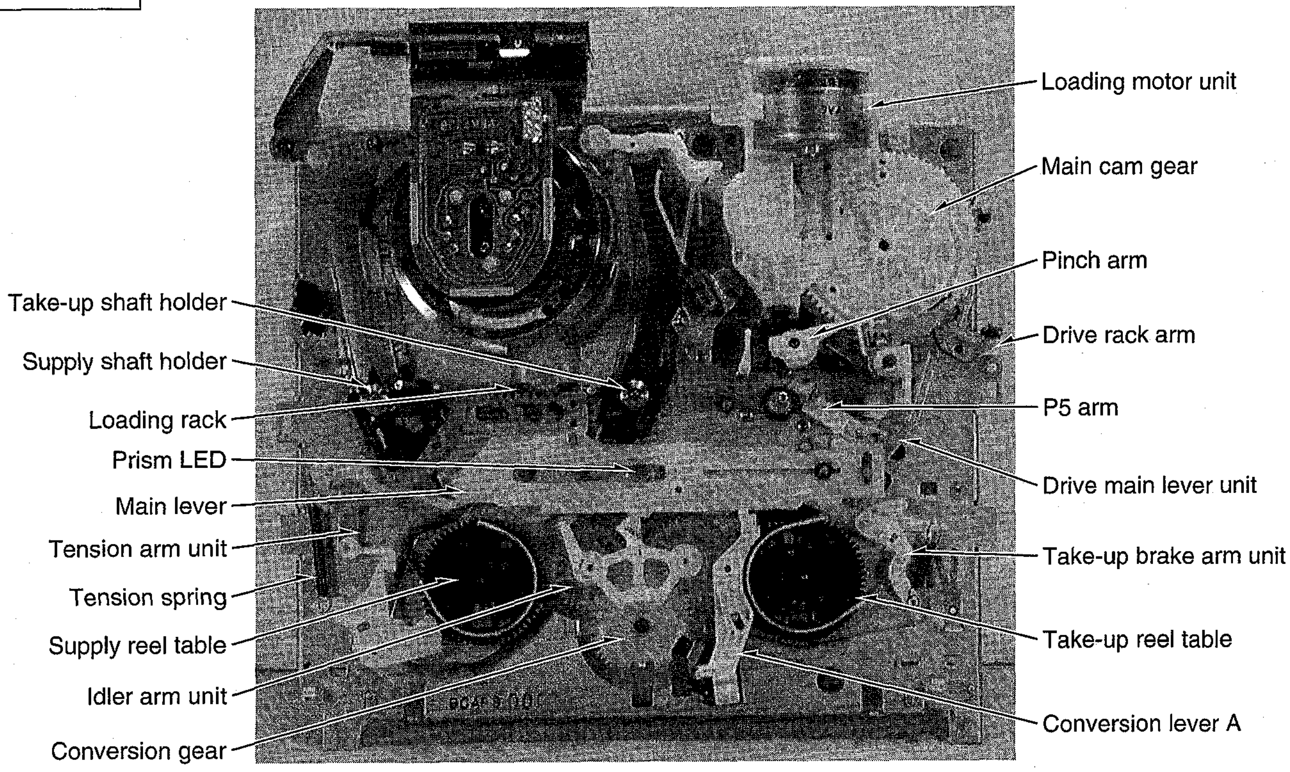
| Mechanism mode | Function | Band |
|---|---|---|
| EJECT-MID | Soft brake | On |
| REV | Soft brake | On |
| PLAY | Release of brake | Off |
| STOP | Brake | On |
| FF/REW | Release of brake | Off |

## 1-4. Number of Gear Phase Alignment Point and Replacement Parts

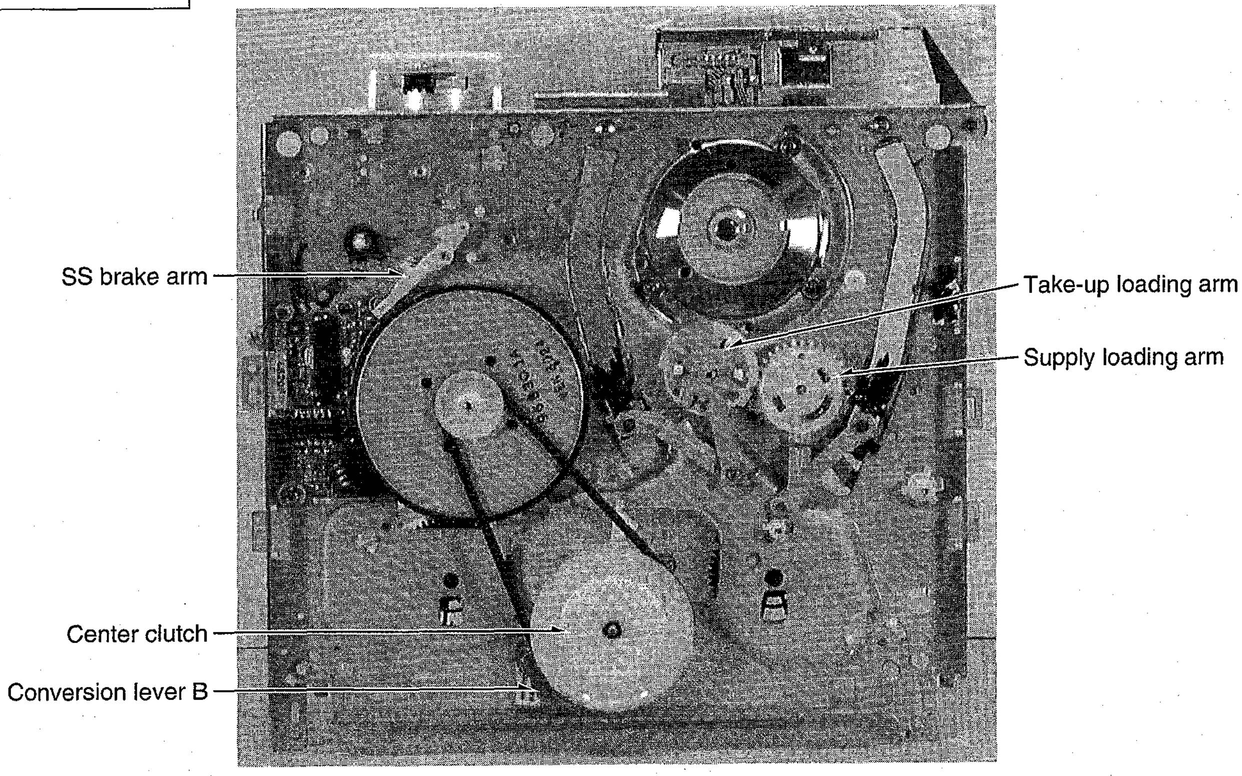
| **Number of Gear Phase Alignment Point** |  |
|---|---|
| G2 Mechanism | 12 Alignment Points |
| G Mechanism | 12 Alignment Points |
| K Mechanism | 6 Alignment Points |
| Z Mechanism | 4 Alignment Points |
| **Number of Replacement Parts (including the Screw and Washer)** |  |
| G2 Mechanism | Approx.170 Pieces |
| G Mechanism | Approx. 150 Pieces |
| K Mechanism | Approx. 100 Pieces |
| Z Mechanism | Approx. 70 Pieces |

## Z Mechanism Components

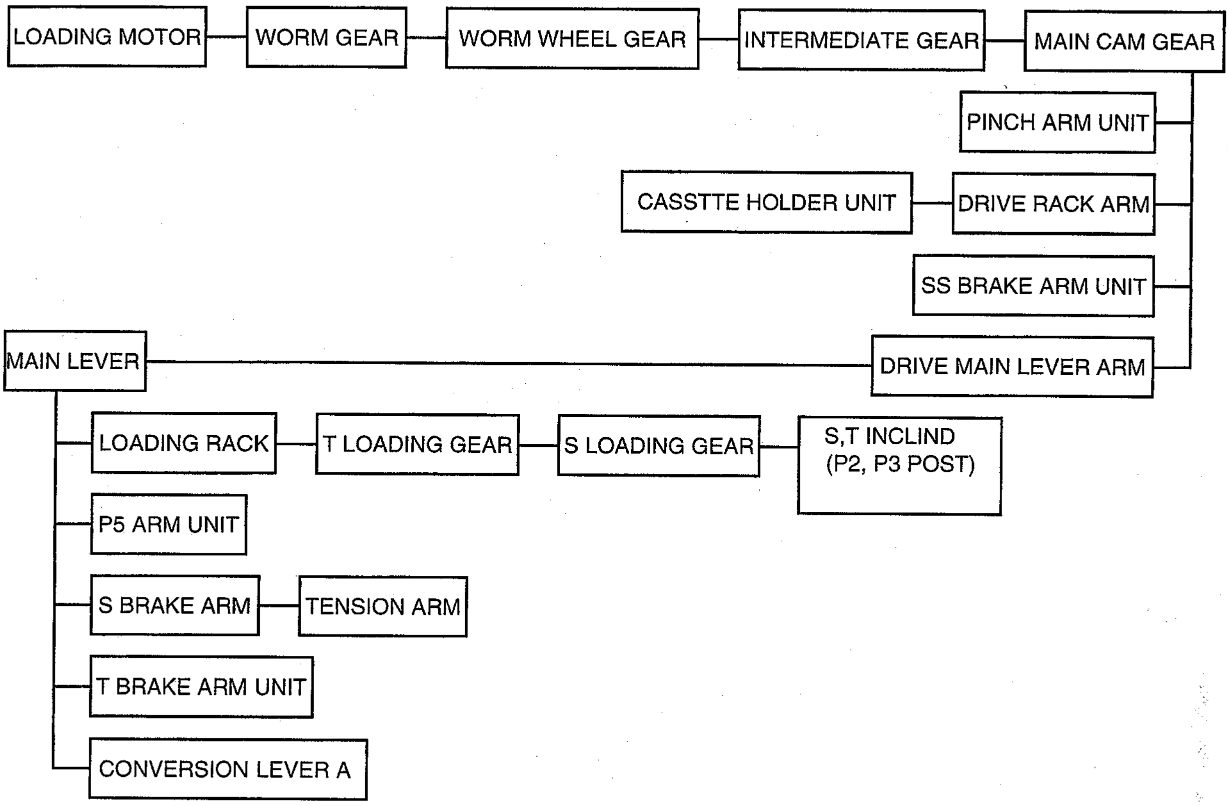
### TOP VIEW

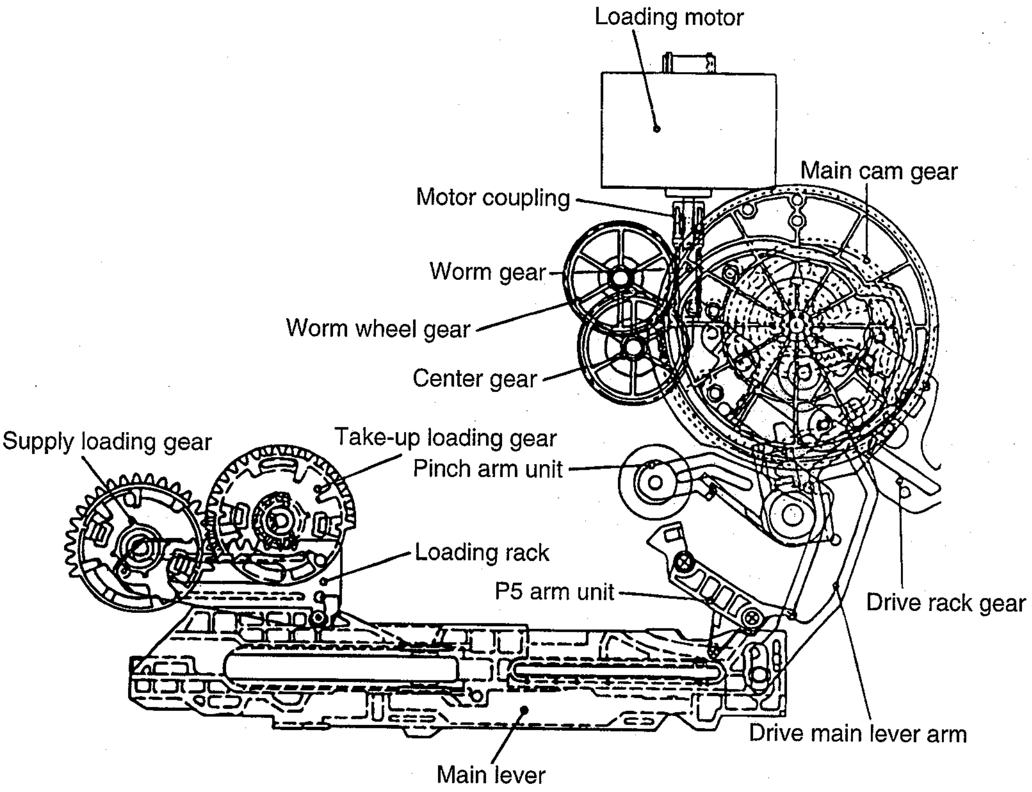

Loading motor unit
Main cam gear
Pinch arm
Drive rack arm
P5 arm
Drive main lever unit
Take-up brake arm unit
Take-up reel table
Conversion lever A
Take-up shaft holder
Supply shaft holder
Loading rack
Prism LED
Main lever
Tension arm unit
Tension spring
Supply reel table
Idler arm unit
Conversion gear

### BOTTOM VIEW


SS brake arm
Take-up loading arm
Supply loading arm
Center clutch
Conversion lever B

## FLOW CHART OF LOADING MECHANISM


LOADING MOTOR
WORM GEAR
WORM WHEEL GEAR
INTERMEDIATE GEAR
MAIN CAM GEAR
PINCH ARM UNIT
CASSTTE HOLDER UNIT
DRIVE RACK ARM
SS BRAKE ARM UNIT
MAIN LEVER
DRIVE MAIN LEVER ARM
LOADING RACK
T LOADING GEAR
S LOADING GEAR
S,T INCLIND
(P2, P3 POST)
P5 ARM UNIT
S BRAKE ARM
TENSION ARM
T BRAKE ARM UNIT
CONVERSION LEVER A


Loading motor
Main cam gear
Motor coupling
Worm gear
Worm wheel gear
Center gear
Supply loading gear
Take-up loading gear
Pinch arm unit
Loading rack
P5 arm unit
Drive rack gear
Drive main lever arm
Main lever

## 2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

### 2-1. Removal of compulsory loading

(1) Press FF and EJECT buttons simultaneously for more than 3 seconds and set the Service Mode 7.

In case of VCR mounted shuttle ring, turn the shuttle ring to FF and then press EJECT button for more than 3 seconds.

In Loewe model, STOP button is used instead of FF button.

(2) Press STOP button in order to unload the mechanism. (Pay an attention of tape slack)

Service Mode Indication :

7 ※※ ※※ (STOP)→7 00 ※※ (EJECT)

### 2-2. Removal of manual operation of Main cam gear

(1) Disconnect the AC power cord and remove Top Panel.

(2) Rotate Main cam gear to the clockwise and unload the mechanism (Tape is remaining) (Fig. A1).

**TOP VIEW**

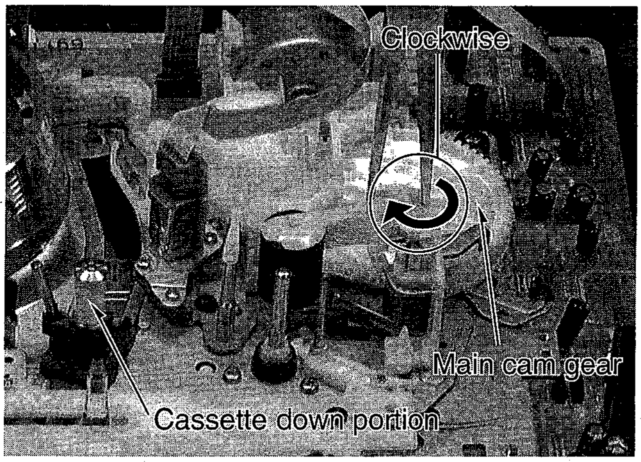


Fig. A1

(3) Rotate the Pole of Capstan motor to the clockwise from the bottom in order to remove the tape slack (Fig. A2).

**BOTTOM VIEW**

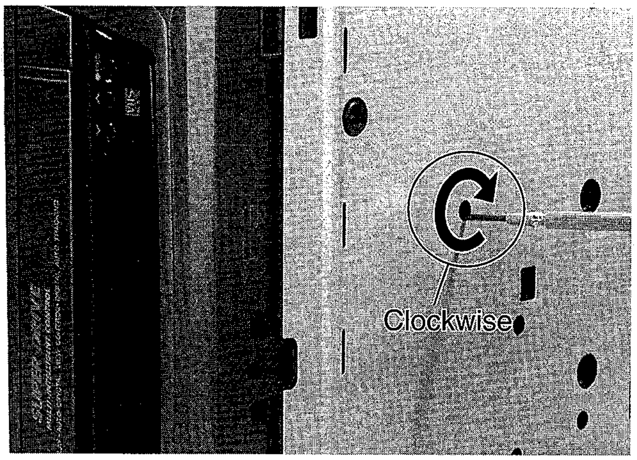


Fig. A2

(4) Rotate Main cam gear to the clockwise in order to eject the cassette tape.

# 3. REMOVAL OF CASSETTE HOLDER UNIT & MECHANISM CHASSIS

## 3-1. Removal of Cassette holder unit

(1) Remove Top panel and Front panel unit (Fig. B1).

**TOP VIEW**

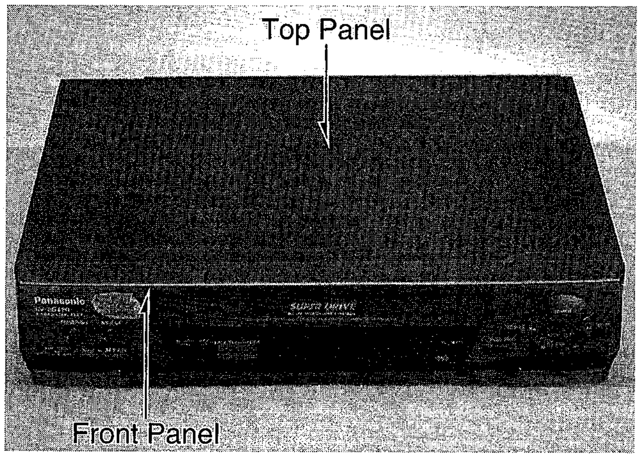

Top Panel
Front Panel

Fig. B1

(2) Remove Top plate

Remove 4 tabs fixing Top plate and remove Top plate (Fig. B2).

※ 4 Tabs should be removed softly due to they are fragile.

**TOP VIEW**

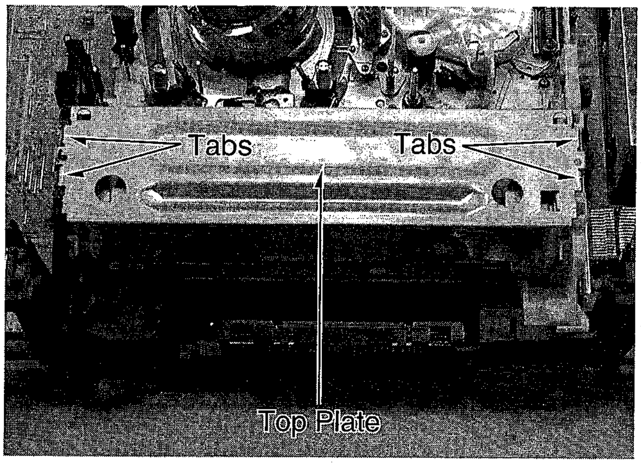

Tabs
Tabs
Top Plate

Fig. B2

(3) Remove Cassette Holder

Keep pressing 2 stoppers on Cassette holder and Press Cassette holder to the rear and remove it from Left and Right Side Plate (Fig. B3).

**TOP VIEW**

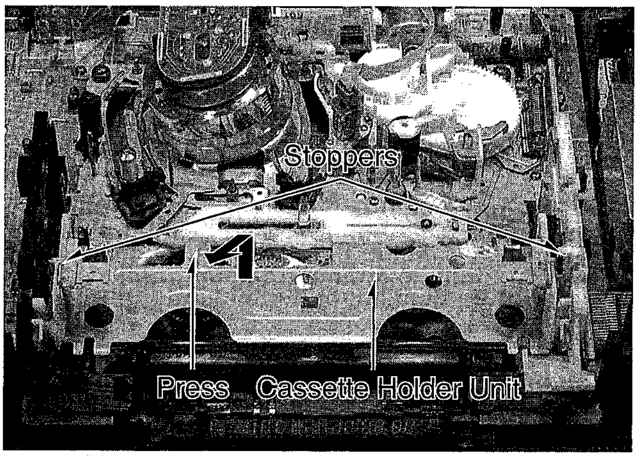

Stoppers
Press
Cassette Holder Unit

Fig. B3

(4) Remove Left and Right Side Plate

Remove connection spring of Drive gear.

Remove 3 red screws, 3 tabs and remove Left and Right Side Plate (Fig. B4, B5).

**TOP VIEW**

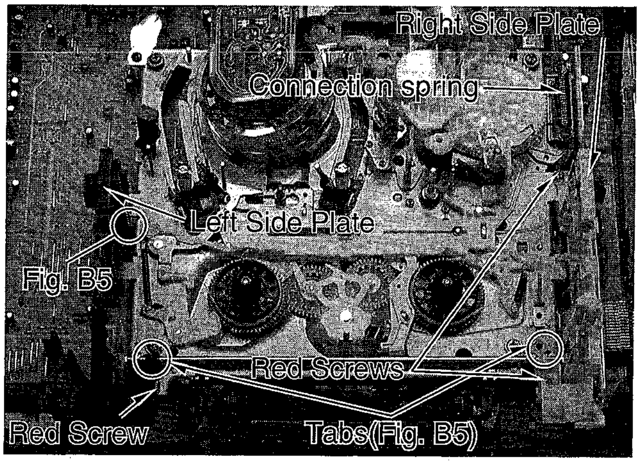

Right Side Plate
Connection spring
Left Side Plate
Fig. B5
Red Screws
Red Screw
Tabs(Fig. B5)

Fig. B4

**TOP VIEW**

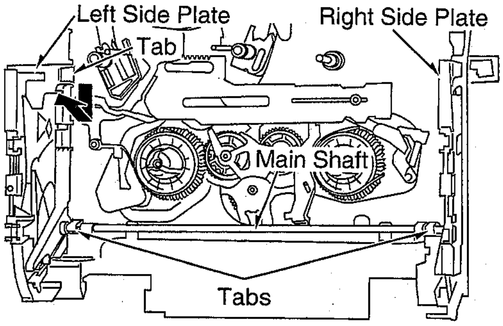

Left Side Plate
Tab
Right Side Plate
Main Shaft
Tabs

Fig. B5

(5) Remove Main shaft (Fig. B6)

**TOP VIEW**

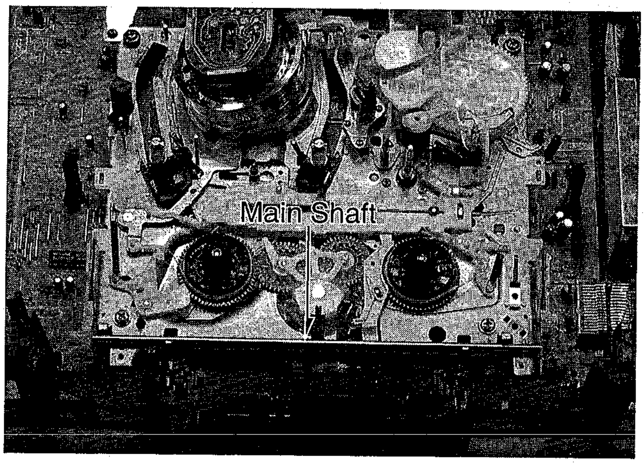


Fig. B6

## 3-2. Removal of Mechanism chassis

(1) Remove Mechanism chassis

Disconnect P3001, P2502 and P4002 (the connectors of Head amp C.B.A., Cylinder unit and A/C Head). Remove 5 screws (3 red screws and 2 gold screws) on Mechanism chassis and take out Mechanism chassis (Fig. B7).

**TOP VIEW**

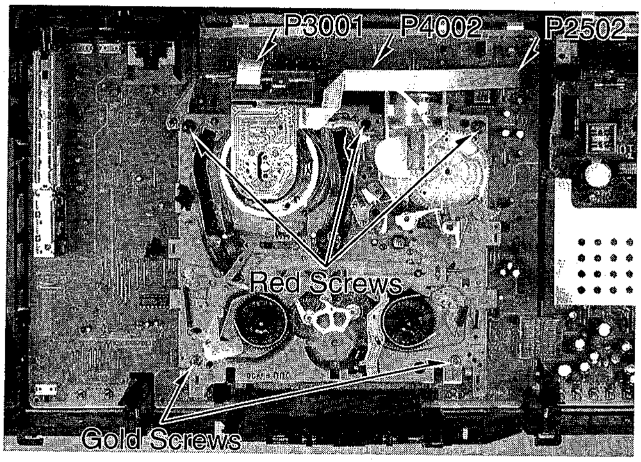

P3001
P4002
P2502
Red Screws
Gold Screws

Fig. B7

# 4. DISASSEMBLY/ASSEMBLY METHOD FOR MECHANISM

## 4-1. Disassembly of mechanism

1. Removal of Pinch arm
   Unlock the tab (opener piece). Remove Opener piece and Pinch arm (Fig. C1).
2. Removal of Loading motor unit
   Unlock 3 tabs and remove Loading motor unit (Fig. C1, C2).
   2 tabs of them located on the bottom of the Mechanism (Fig. C2).

**TOP VIEW**

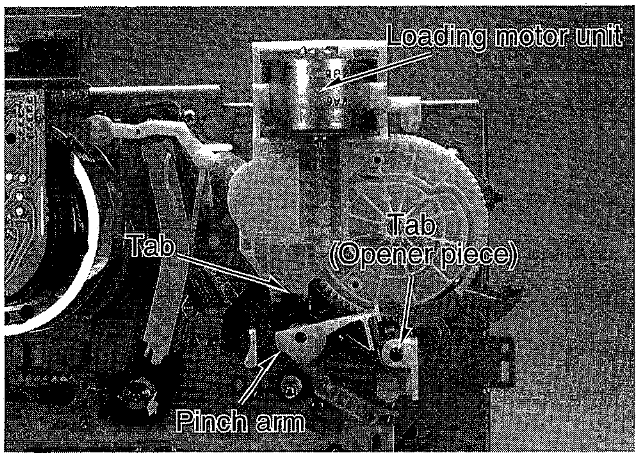

Loading motor unit
Tab
Tab
(Opener piece)
Pinch arm

Fig. C1

**BOTTOM VIEW**

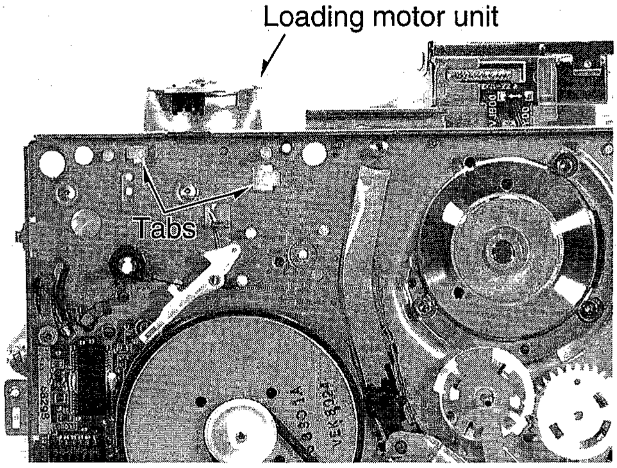

Loading motor unit
Tabs

Fig. C2

3. Removal of Main cam gear
   Remove Snap washer located on the bottom of Chassis by using retaining ring remover (Fig. C3) and remove Main cam gear (Fig. C4).

**BOTTOM VIEW**

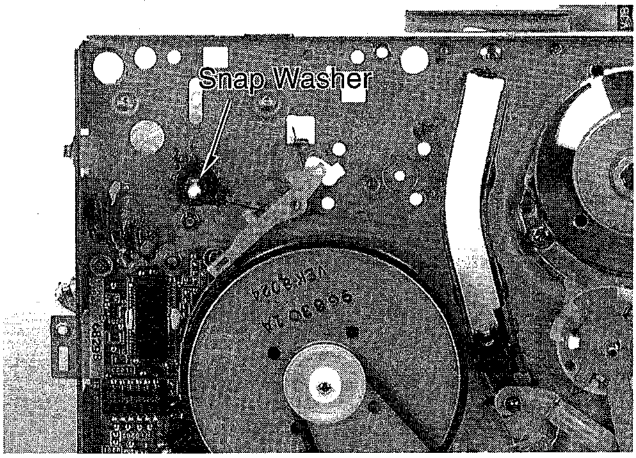

Snap Washer

Fig. C3

**TOP VIEW**

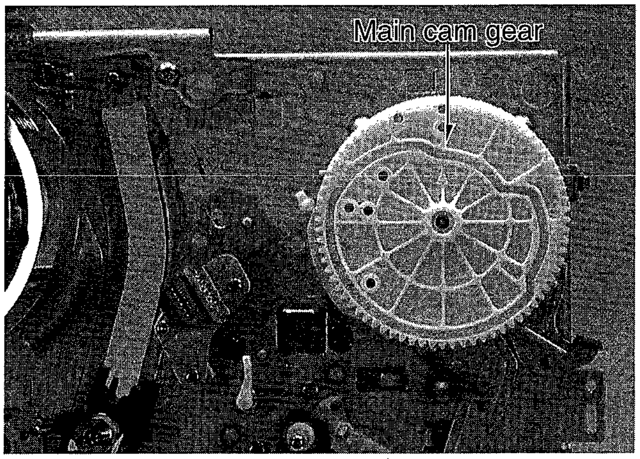

Main cam gear

Fig. C4

4. Removal of Drive rack arm
   Rotate Drive rack arm to the counterclockwise and remove it (Fig. C5).

**TOP VIEW**

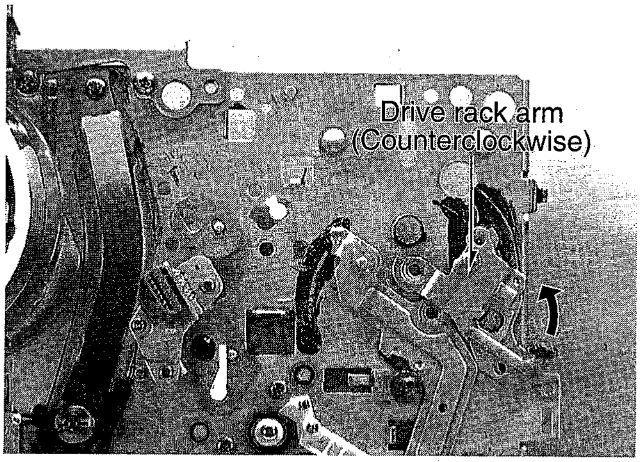

Drive rack arm
(Counterclockwise)

Fig. C5

5. Removal of Main lever, P5 arm and Conversion lever A
   Unlock 2 tabs of Prism LED and 1 tab on the projection of Chassis while keep lifting the left side of Main lever, and remove Main lever, P5 arm and Conversion lever A (Fig. C6).

※ It is easier to unlock the tabs by using a tweezer.

**TOP VIEW**

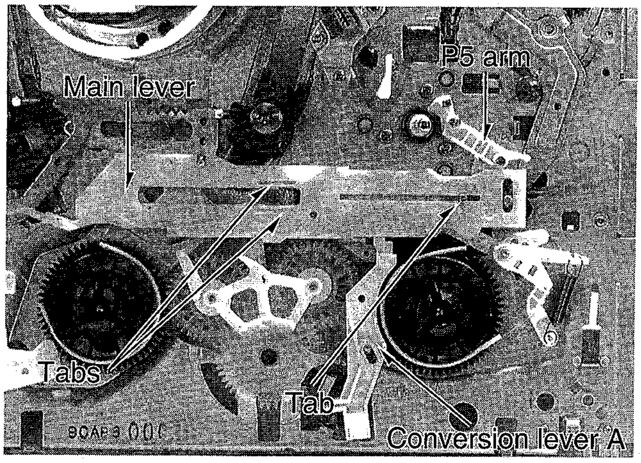

Main lever
P5 arm
Tabs
Tab
Conversion lever A

Fig. C6

6. Removal of Drive main lever arm
   Rotate Drive main lever arm to the counterclockwise and remove it (Fig. C7).

**TOP VIEW**

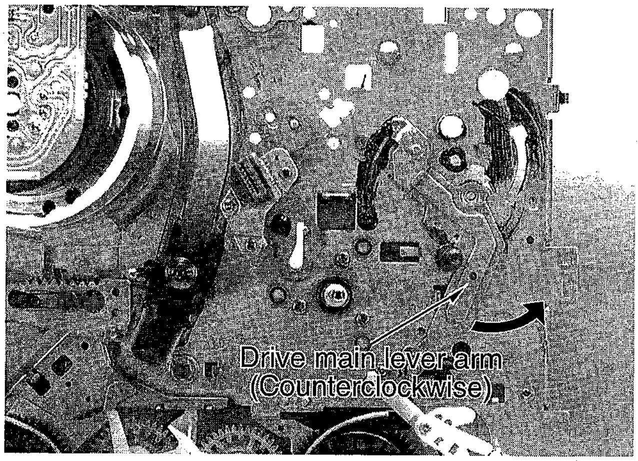

Drive main lever arm
(Counterclockwise)

Fig. C7

7. Removal of Tension arm unit and Supply reel table
   Remove Tension spring (Fig. C8). Unlock the tab of Tension arm projection on the bottom of Chassis (Fig. C9) and remove Tension arm unit and Supply reel table (Fig. C8).

※ When remove supply reel table, be sure whether a washer attaches on Supply reel table shaft (Fig. C10).

**TOP VIEW**

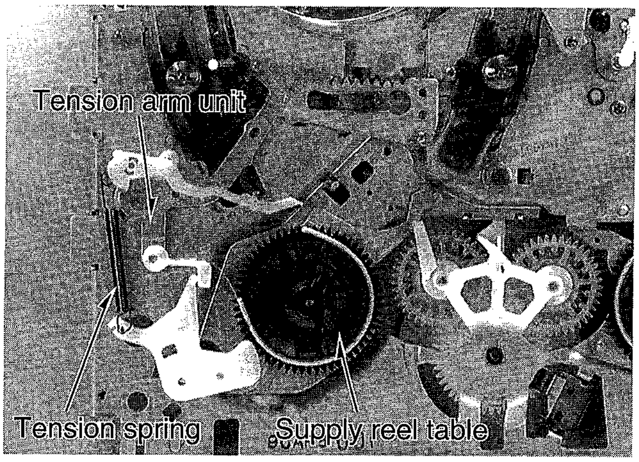

Tension arm unit
Tension spring
Supply reel table

Fig. C8

**BOTTOM VIEW**

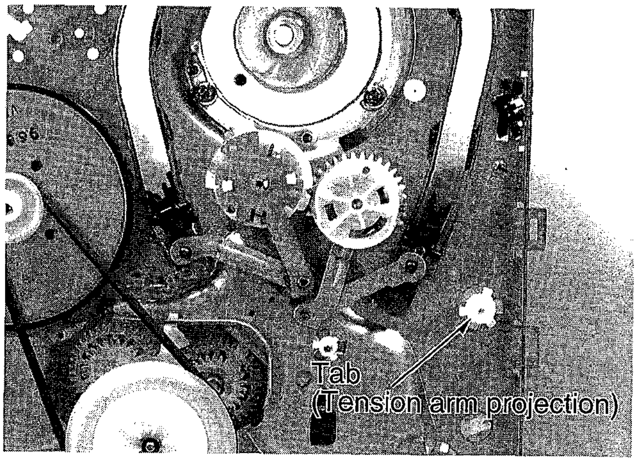

Tab
(Tension arm projection)

Fig. C9

**SIDE VIEW**

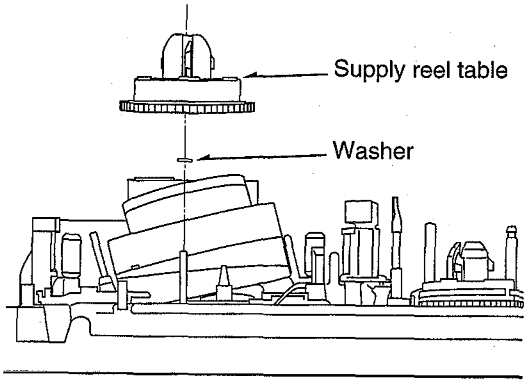

Supply reel table
Washer

Fig. C10

8. Remove of Take-up brake arm unit and Take-up reel table
   Unlock the tab of Take-up brake arm unit from the bottom of Chassis (Fig. C12). Remove Take-up brake arm unit and Take-up reel table (Fig. C11).

※ When remove Take-up reel table, be sure whether a washer attaches on Take-up reel table shaft (Fig. C13).

**TOP VIEW**

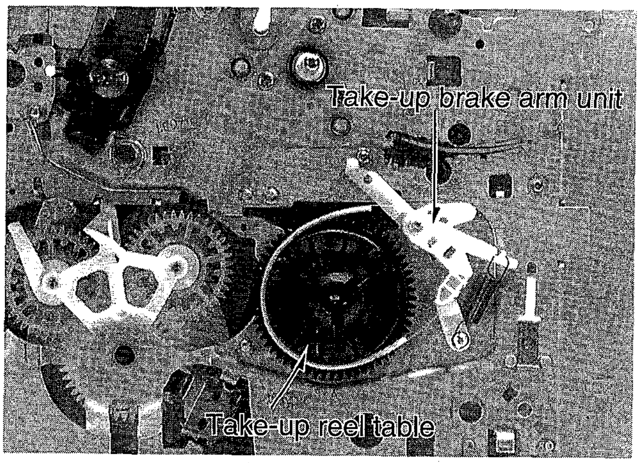

Take-up brake arm unit
Take-up reel table

Fig. C11

**BOTTOM VIEW**

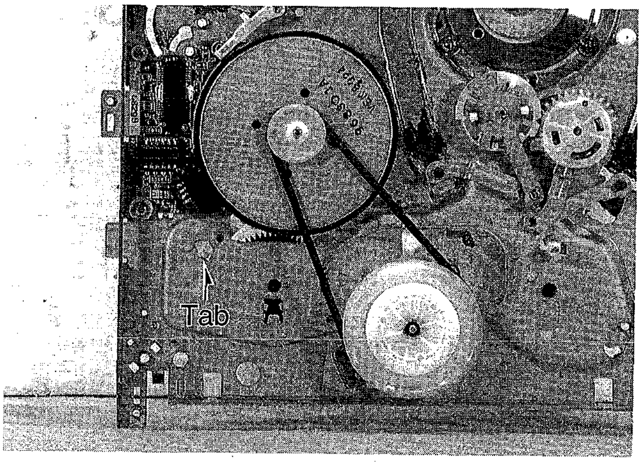


Fig. C12

**SIDE VIEW**

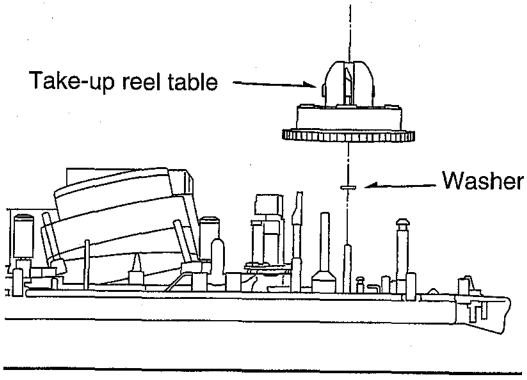

Take-up reel table
Washer

Fig. C13

9. Removal of Take-up & Supply loading arm
   Unlock the tab and remove Take-up and Supply loading arm (Fig. C14).

**BOTTOM VIEW**

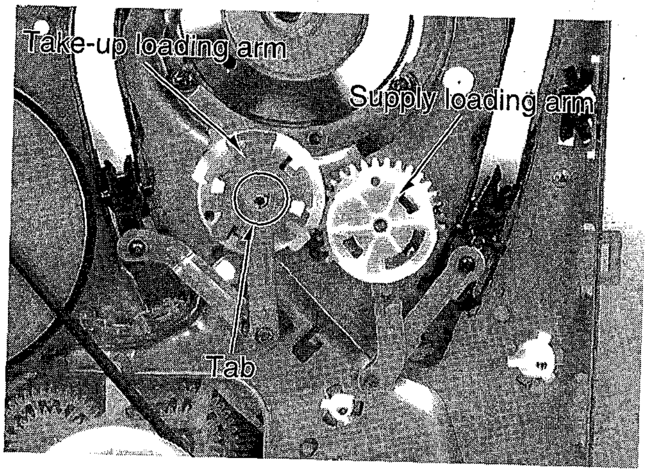

Take-up loading arm
Supply loading arm
Tab

Fig. C14

10. Removal of Prism LED, Take-up & Supply shaft holder and Loading rack
    Push the tab of Prism LED and remove Prism LED. Remove Take-up and Supply shaft holder from the groove of Chassis and remove Loading rack (Fig. C15).

**TOP VIEW**

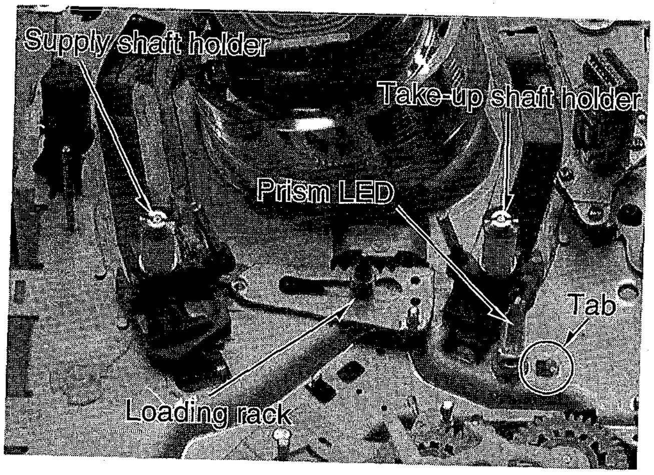

Supply shaft holder
Take-up shaft holder
Prism LED
Tab
Loading rack

Fig. C15

11. Removal of Center clutch, Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit
    Remove the Belt and the Cut washer (Fig. C16). Remove Center clutch (Fig. C16), Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit (Fig. C17).

※ Pay an attention of Conversion gear spring during the removal.

**BOTTOM VIEW**

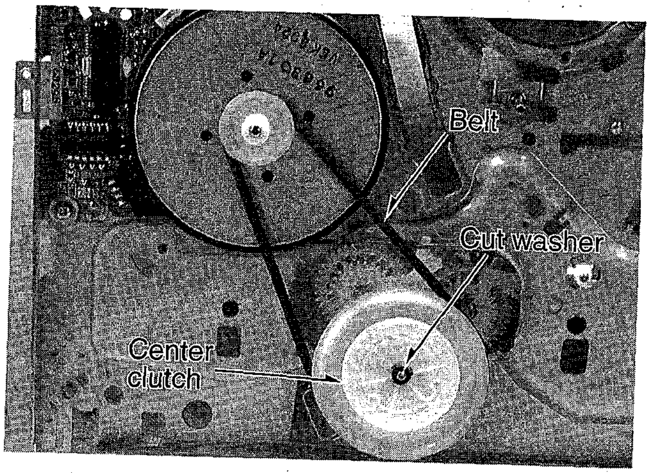

Belt
Cut washer
Center clutch

Fig. C16

**BOTTOM VIEW**

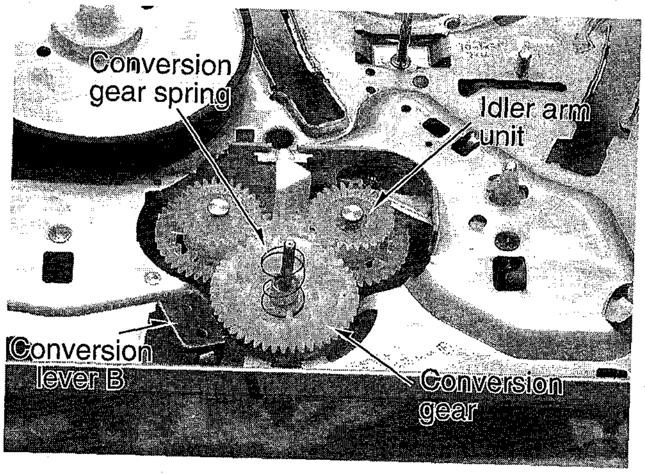

Conversion gear spring
Idler arm unit
Conversion lever B
Conversion gear

Fig. C17

12. Removal of Capstan unit

Remove 3 gold screws (Fig. C18).

Remove 2 gold screws on the bottom of Chassis (Fig. C19).

Keep moving SS brake arm and remove Capstan unit.

**TOP VIEW**

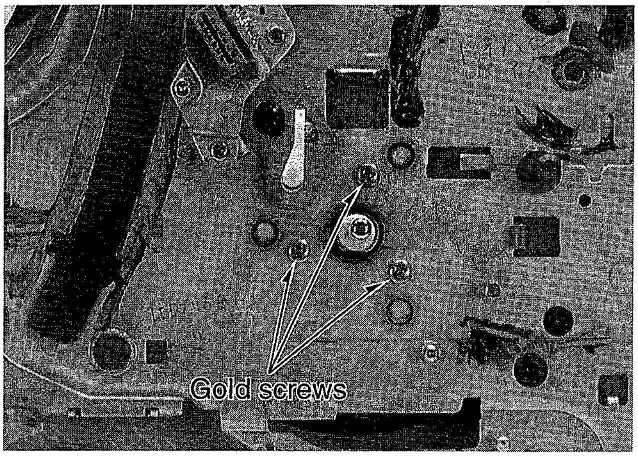

Gold screws

Fig. C18

**BOTTOM VIEW**

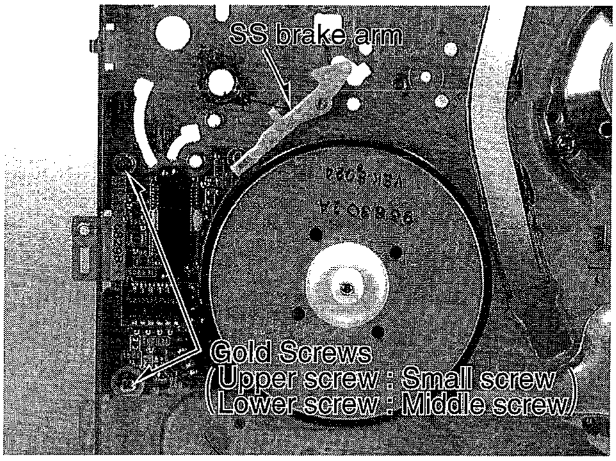

SS brake arm
Gold Screws
(Upper screw : Small screw
Lower screw : Middle screw)

Fig. C19

13. Removal of Cylinder unit

Remove red screw (Fig. C20).

Remove 3 gold screws on the bottom of Chassis and remove Cylinder unit (Fig. C21).

**TOP VIEW**

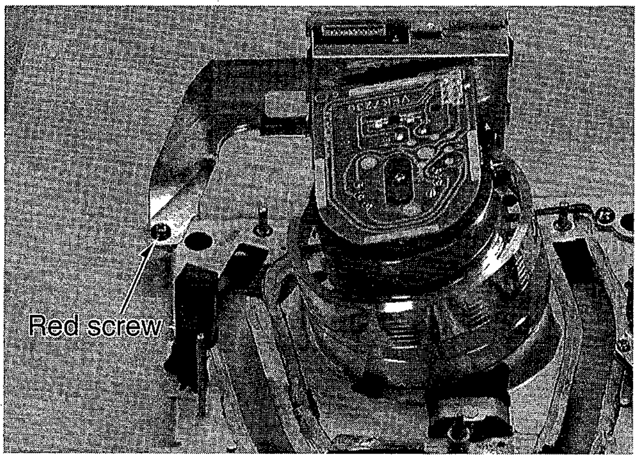


Fig. C20

**BOTTOM VIEW**

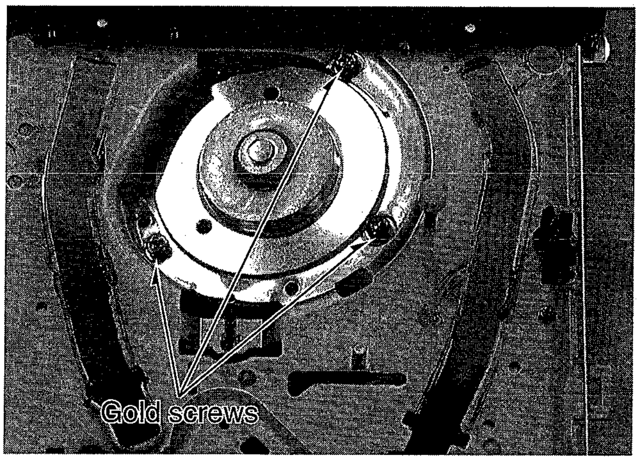

Gold screws

Fig. C21

## 4-2. Assembly and phase adjustment of mechanism

The gear phase alignment has been performed in the EJECT position and it is crucial for the Z Mechanism to operate correctly.

NOTE: In case of the parts replacement like Position switch, Mechanism position should be set to Eject position in order to fit the phase of Position switch.

1. Assembly and phase adjustment of Mechanism

(1) Assembly of Cylinder unit

Cylinder unit should be fixed by 3 screws (GOLD) from the bottom side of Mechanism chassis and red screw on the top side of Mechanism Chassis (Fig. E1, E2).

**BOTTOM VIEW**

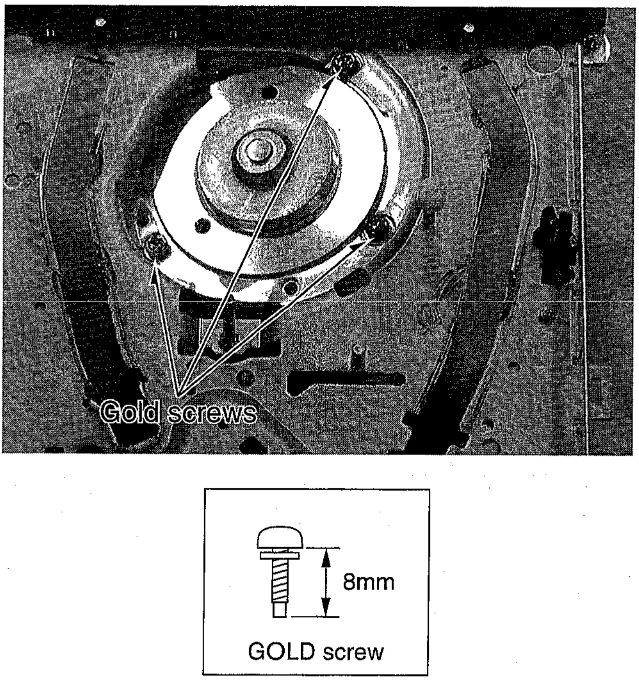

Gold screws
8mm
GOLD screw

Fig. E1

**TOP VIEW**

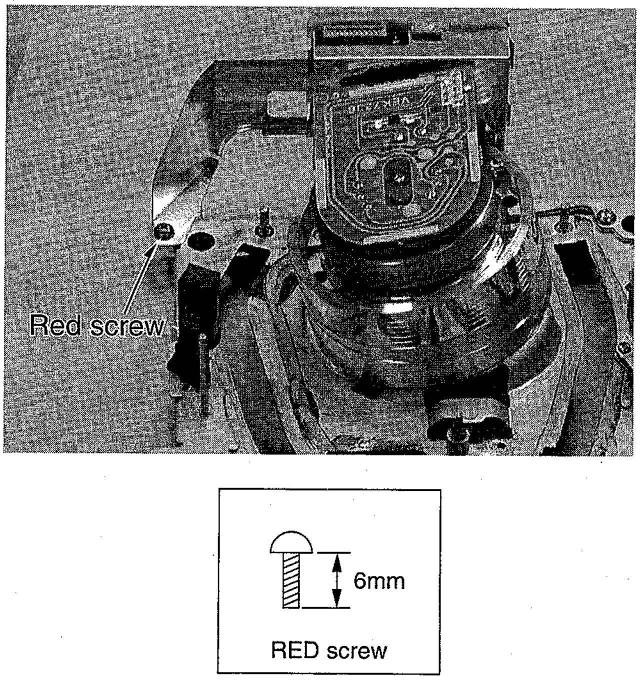

Red screw
6mm
RED screw

Fig. E2

(2) Assembly of Capstan unit

Move SS brake arm in the direction of arrow (see Fig. E3) and capstan unit should be fixed by 2 screws (GOLD) on the bottom side of Mechanism chassis and 3 screws (GOLD) on the top of Mechanism chassis (Fig. E3, E4).

**BOTTOM VIEW**

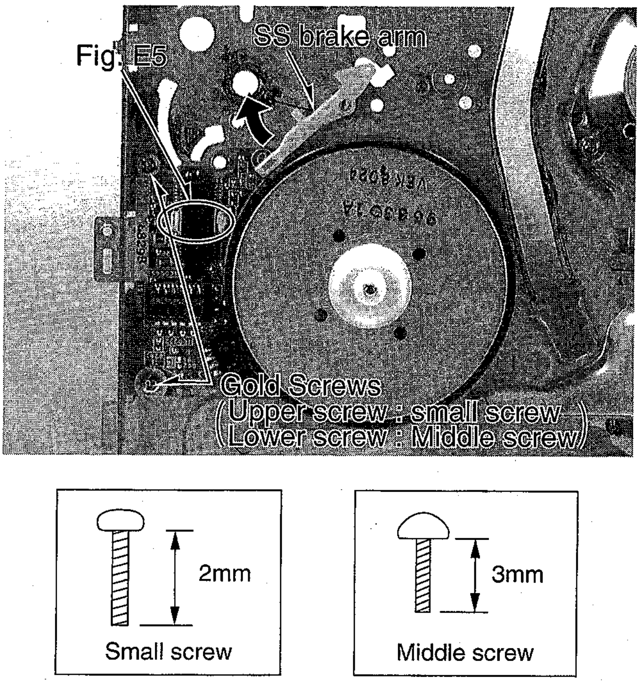


Fig. E5
SS brake arm
Gold Screws
(Upper screw : small screw
Lower screw : Middle screw)
2mm
Small screw
3mm
Middle screw

Fig. E3

## TOP VIEW

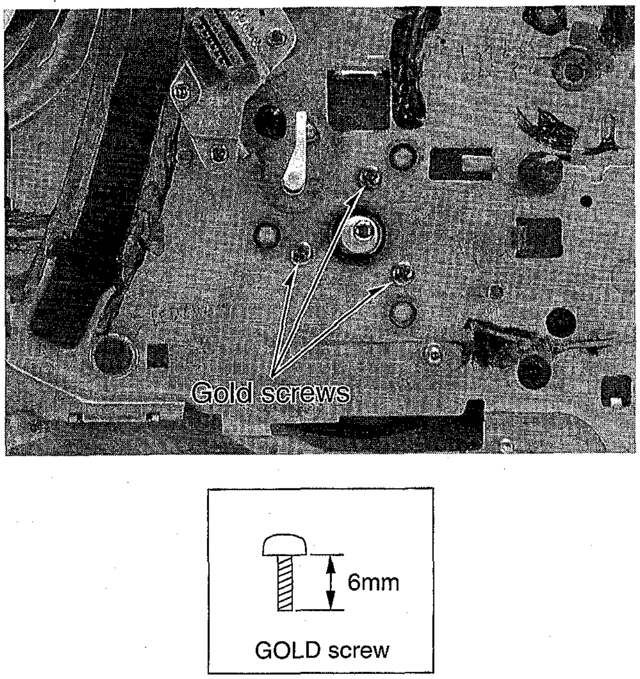


Fig. E4

NOTE: Replacement of Capstan unit and Procedure of applying the silicone grease.

## REPLACEMENT OF CAPSTAN UNIT

In case of replacement of the Capstan Unit the Silicone grease have to be applied between the Mechanism chassis and the Drive IC by the following procedure.

Silicone grease No. VFK1301 for radiation of the Drive IC

Silicone grease is used for the radiation of the Drive IC. The heat occurred on the IC is radiated to the Mechanism chassis through the grease. In case of the incomplete radiation, the safety circuit operates depending on the rise of the temperature and it possibility stop the operation of the Drive IC.

## PROCEDURE OF APPLYING THE SILICONE GREASE

① There is a cut-out part at the Drive IC mounting position and the bottom of the IC can be seen from the cut-out part. Apply the Silicon grease to whole the cut-out part of IC as shown in Fig. E5-1 so that the grease is piled 0.3–0.5 mm from the surface of the C.B.A.

② Next, from the component side of the C.B.A., apply the Silicon grease so that the grease is piled at the metal of the center of the IC as shown in Fig. E5-2.

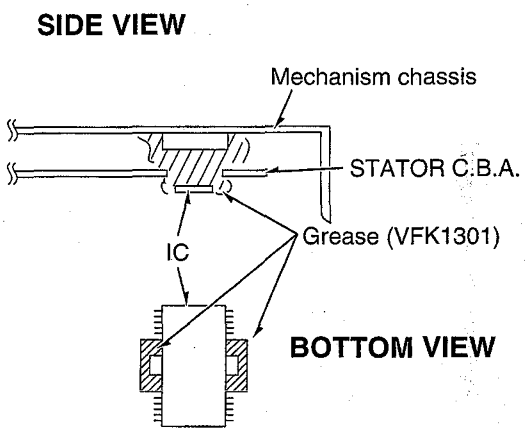


Fig. E5

### TOP VIEW

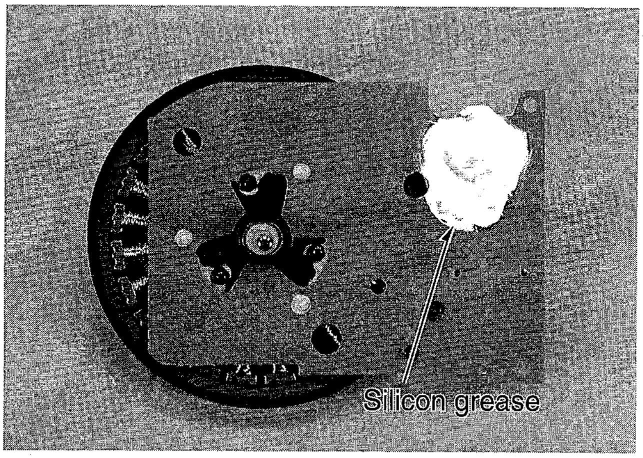

Silicon grease

Fig. E5-1

Fig. E5-1. Apply the Silicon grease so that the grease is piled 0.3–0.5 mm from the surface of the C.B.A.

### BOTTOM VIEW

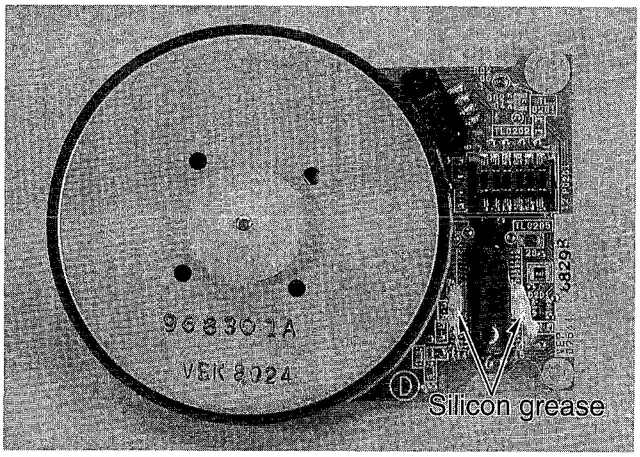

Ⓓ
Silicon grease

Fig. E5-2

Fig. E5-2. Apply the Silicon grease at the metal of the center of the IC.

(3) Assembly of Idler arm unit, Conversion lever B, Conversion gear, Conversion gear spring and Center clutch

Put above parts together in the following order and fix them by Cut washer (Fig. E6), and install Capstan belt.

① Idler arm unit
② Conversion lever B
③ Conversion gear
④ Conversion gear spring
⑤ Center clutch

### BOTTOM VIEW

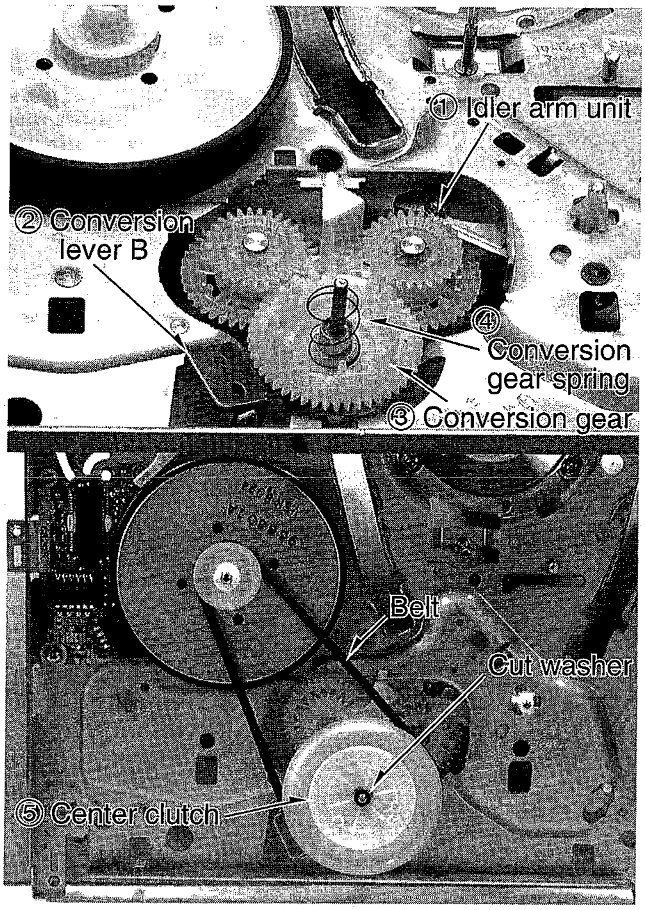

① Idler arm unit
② Conversion lever B
④ Conversion gear spring
③ Conversion gear
Belt
Cut washer
⑤ Center clutch

Fig. E6

(4) Assembly of Loading rack, Take-up & Supply shaft holder and Prism LED
Adjust the phase between the hole of Loading rack position fixture and the penetration hole of Chassis. Install Take-up and Supply shaft holder so that Take-up and Supply shaft holder fits the groove of Chassis.
Put Prism LED together (Fig. E7).

**TOP VIEW**

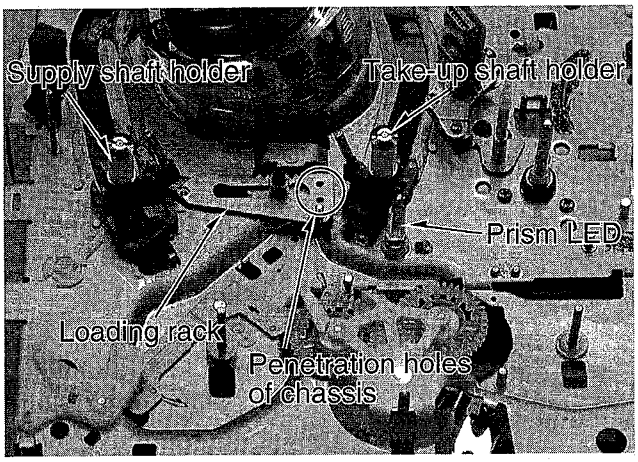

Supply shaft holder
Take-up shaft holder
Prism LED
Loading rack
Penetration holes of chassis

Fig. E7

(5) Assembly of Take-up and Supply Loading arm
Move Shaft holder to the unloading position. Adjust the phase of Take-up and Supply loading arm and insert the arm to the shaft (Fig. E8).

**BOTTOM VIEW**

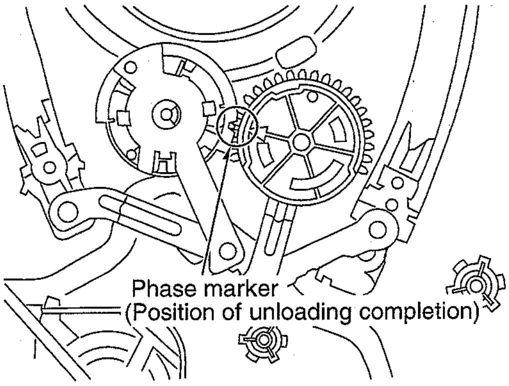

Phase marker
(Position of unloading completion)

Fig. E8

(6) Assembly of Take-up reel table and Take-up brake arm unit
Put washer, (Fig. E10) Take-up reel table and Take-up brake arm unit together (Fig. E9).

NOTE: The shape between portion A for Take-up reel table and portion B for Supply reel table is different.
Therefore, confirm the shape of portion A and B before mounting reel tables. If Take-up reel table has been confused with Supply reel table and they have been installed, the trouble of reel table rotation slip happens (Fig. E11).

**TOP VIEW**

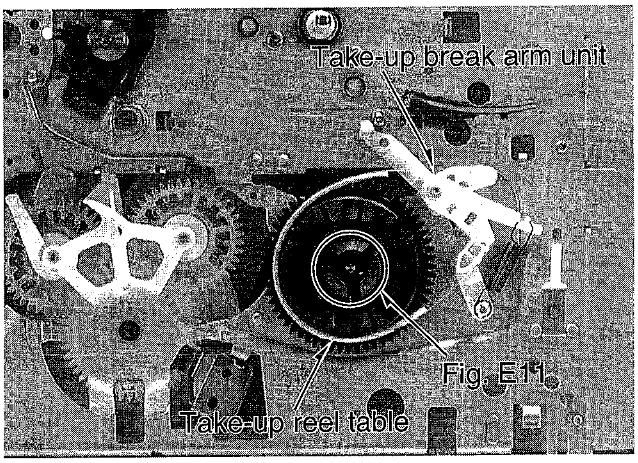

Take-up break arm unit
Fig. E11
Take-up reel table

Fig. E9

**SIDE VIEW**

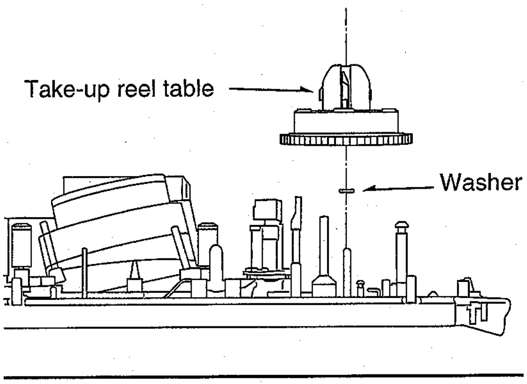

Take-up reel table
Washer

Fig. E10

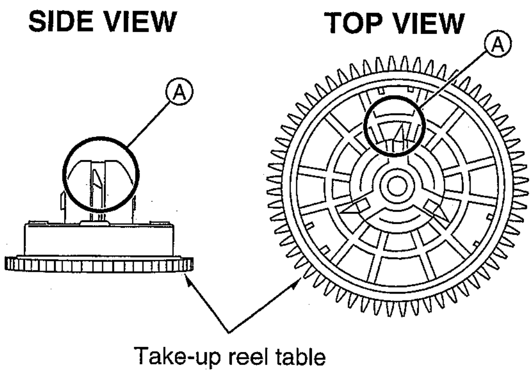

SIDE VIEW
TOP VIEW
Ⓐ
Ⓐ
Take-up reel table

Fig. E11

(7) Assembly of Supply reel table and Tension arm unit

Install washer (Fig. E13) and Supply reel table. Insert Tension arm unit to Tension arm projection and hang Tension spring with Supply spring arm projection (Fig. E12).

※1 Pay an attention of Position of the Supply spring arm.

NOTE: The shape between portion A for Take-up reel table and portion B for Supply reel table is different.

Therefore, confirm the shape of portion A and B before mounting reel tables. If Take-up reel table has been confused with Supply reel table and they have been installed, the trouble of reel table rotation slip happens (Fig. E14).

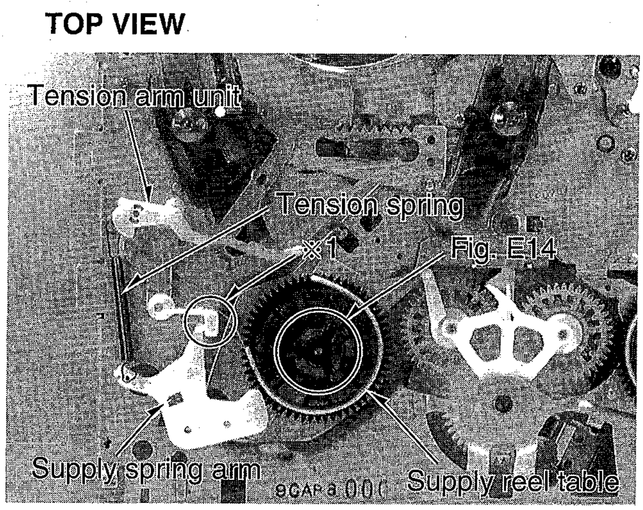

TOP VIEW
Tension arm unit
Tension spring
※1
Fig. E14
Supply spring arm
Supply reel table

Fig. E12

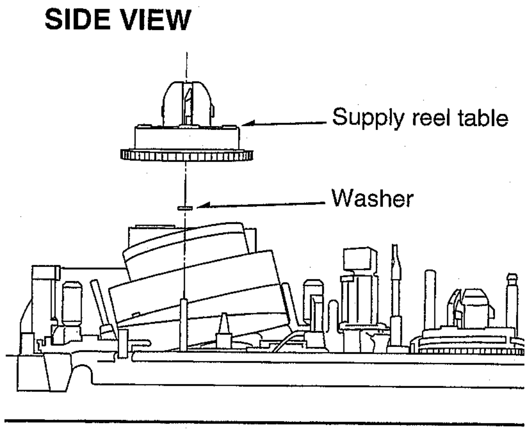

SIDE VIEW
Supply reel table
Washer

Fig. E13

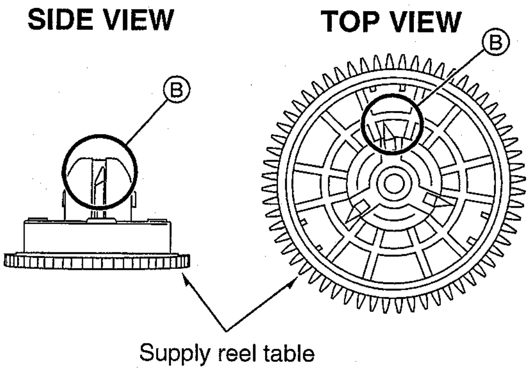

SIDE VIEW
TOP VIEW
Ⓑ
Ⓑ
Supply reel table

Fig. E14

(8) Assembly of Drive main lever arm

Install Drive main lever arm so that Drive main lever arm fits to the groove of Chassis.

And rotate Drive main lever arm to the clockwise in order to adjust the phase between the hole of the position fixture and the penetration hole of Chassis (Fig. E15).

**TOP VIEW**

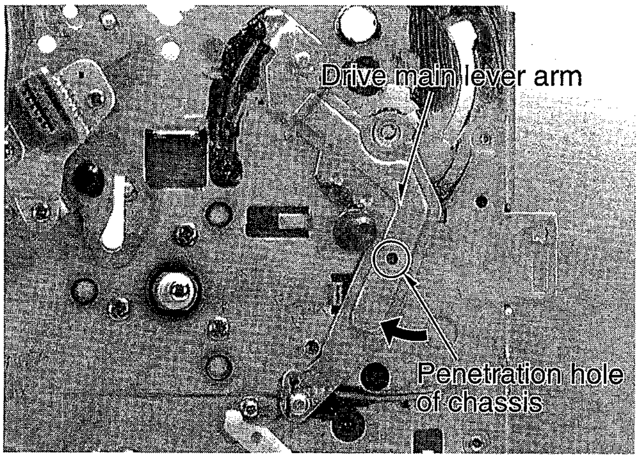

Drive main lever arm
Penetration hole of chassis

Fig. E15

(9) Assembly of Conversion lever A, P5 arm and Main lever

Install Conversion lever A and P5 arm (Fig. E16, E17).

Adjust the phase of Main lever so that Main lever fits the projection of Loading rack.

Main lever has to be locked at the projection of Chassis by 1 tab, and 2 tabs of Prism LED (Fig. E16).

※ Conversion lever A, P5 arm, Supply brake arm unit and the projection of Take-up brake arm have to be installed to the groove under the Main lever (Fig. E18).

**TOP VIEW**

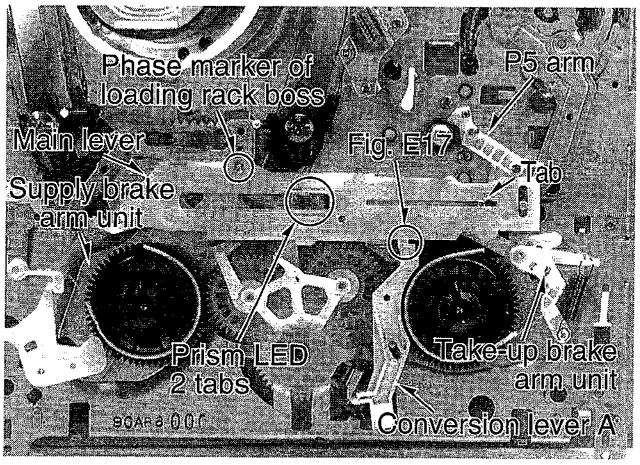

Phase marker of loading rack boss
P5 arm
Main lever
Fig. E17
Tab
Supply brake arm unit
Prism LED 2 tabs
Take-up brake arm unit
Conversion lever A

Fig. E16

**TOP VIEW**

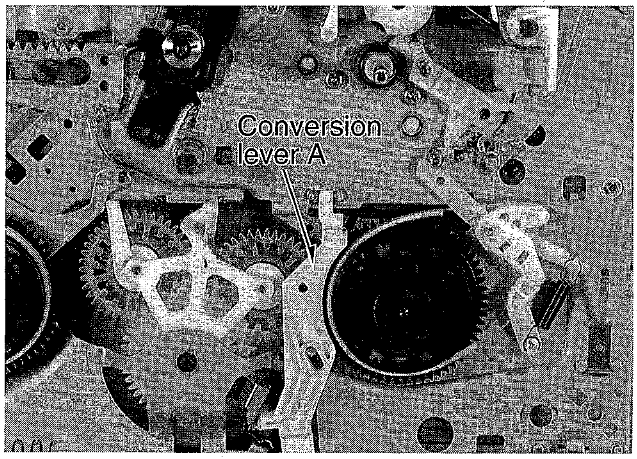

Conversion lever A

Fig. E17

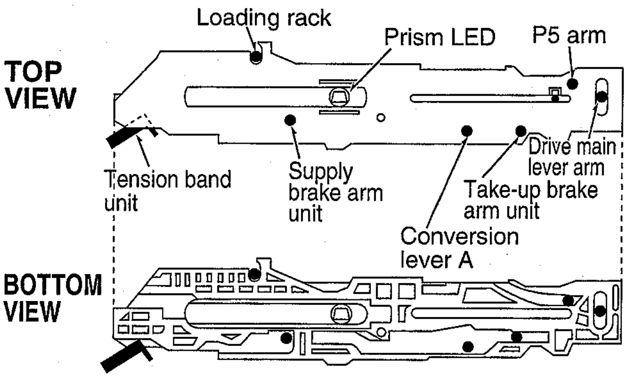

Loading rack
Prism LED
P5 arm
TOP VIEW
Tension band unit
Supply brake arm unit
Drive main lever arm
Take-up brake arm unit
Conversion lever A
BOTTOM VIEW

Fig. E18

(10) Assembly of Drive rack arm

Install Drive rack arm so that Drive rack arm fits the groove of Chassis and rotate it to the clockwise in order to fit the penetration hole of Chassis (Fig. E19).

**TOP VIEW**

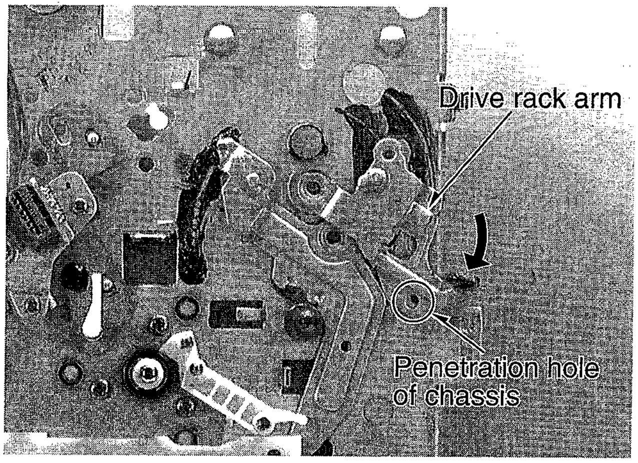

Drive rack arm
Penetration hole of chassis

Fig. E19

(11) Assembly of Main cam gear

Install Main cam gear so that Main cam gear fits the penetration hole of Chassis (Fig. E20) and fix it by the snap washer from the bottom of Chassis (Fig. E21).

**TOP VIEW**

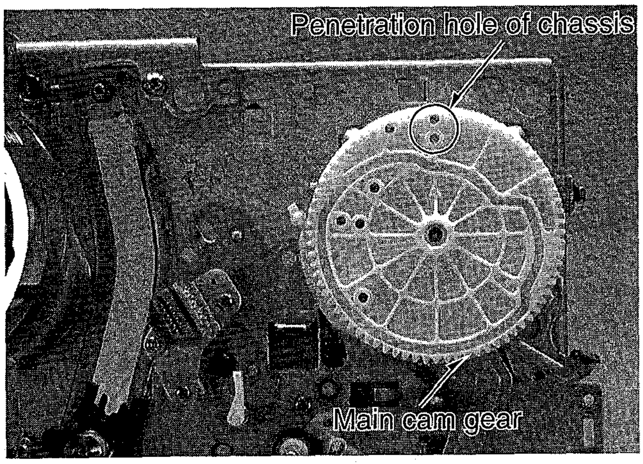

Penetration hole of chassis
Main cam gear

Fig. E20

**BOTTOM VIEW**

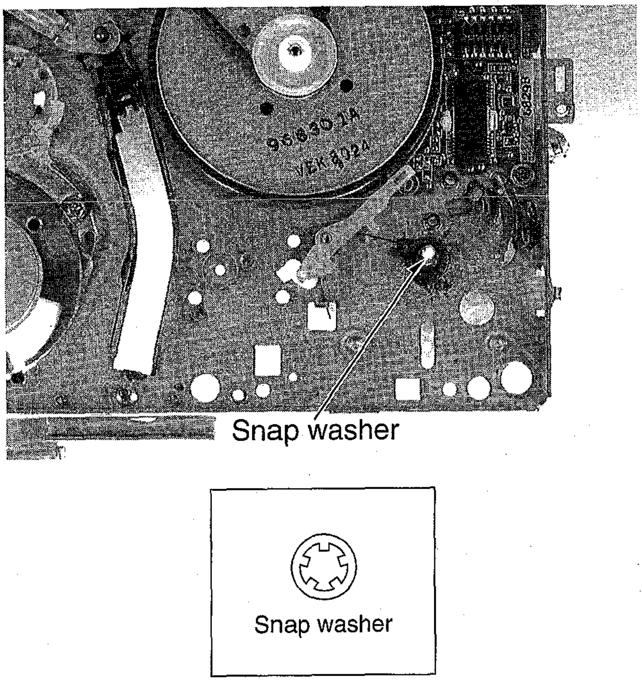

Snap washer
Snap washer

Fig. E21

(12) Assembly of Loading motor unit

Install Loading motor unit so that Loading motor unit fits the groove of Chassis (Fig. E22).

(13) Assembly of Pinch arm

Put Pinch arm together and install Opener piece to fix Pinch arm (Fig. E22).

**TOP VIEW**

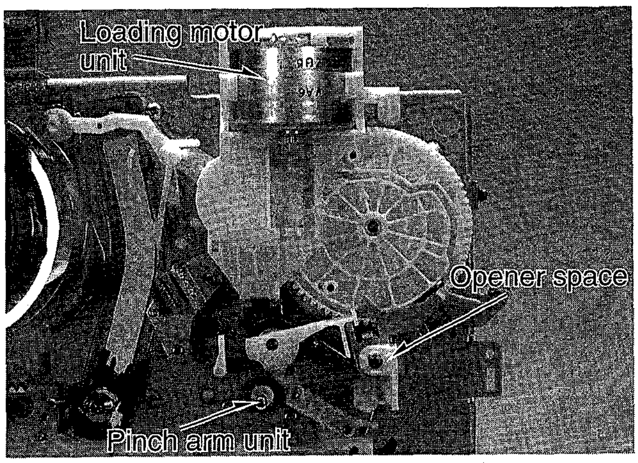

Loading motor unit
Opener space
Pinch arm unit

Fig. E22

## 4-3. Assembly of mechanism chassis

1. Assembly of Mechanism chassis

(1) Adjust the phase of Position switch in Main C.B.A..

Rotate Position switch until the click point. The projection of Position switch should be set to just above (Fig. F1).

**TOP VIEW**

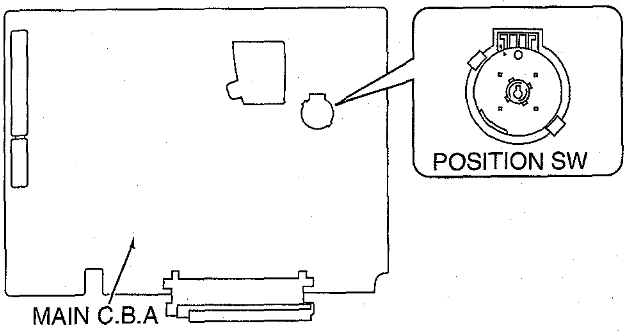

POSITION SW
MAIN C.B.A

Fig. F1

(2) Assembly of Mechanism chassis
Put Mechanism chassis on Main C.B.A. and fix it by 5 screws (3 red screws and 2 gold screws). Connect P3001, P2502 and P4002 (Fig. F2).

**TOP VIEW**

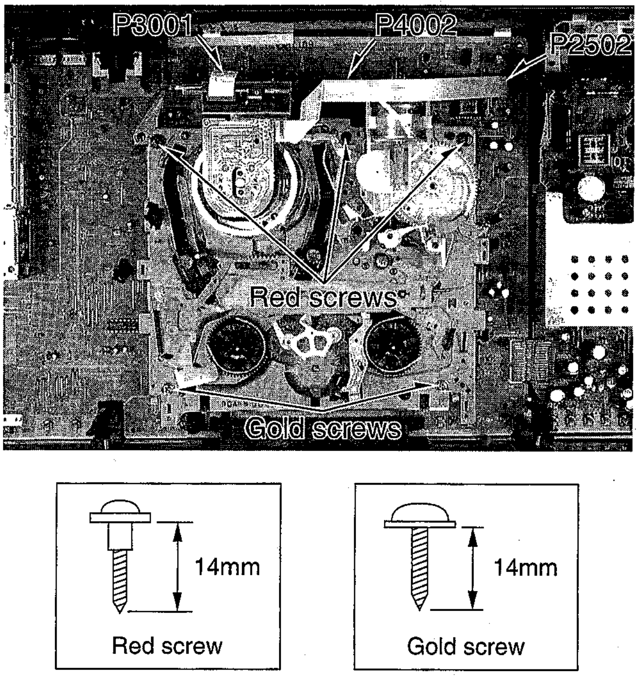

P3001
P4002
P2502
Red screws
Gold screws
14mm
Red screw
14mm
Gold screw

Fig. F2

※ The red screws has a gap among the chassis. Therefore be careful not to tighten too much.

2. Assembly of Cassette holder unit

(1) Assembly of Main shaft
Install Main shaft so that Main shaft fits the groove of Chassis (Fig. F3).

**TOP VIEW**

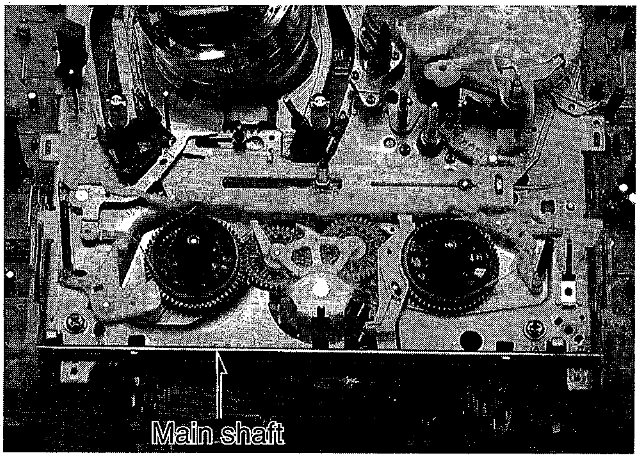


Fig. F3

(2) Assembly of Left & Right side plate
Install Left side plate so that Left side plate fits the groove of Chassis and fix it by the red screws.
After adjustment the phase of waper arm and Drive rack (Fig. F5), install Right side plate so that Right side plate fits the groove of Chassis and fix it by 2 red screws. Hang connection spring on the projection of Drive rack arm (Fig. F4, F5).

**TOP VIEW**

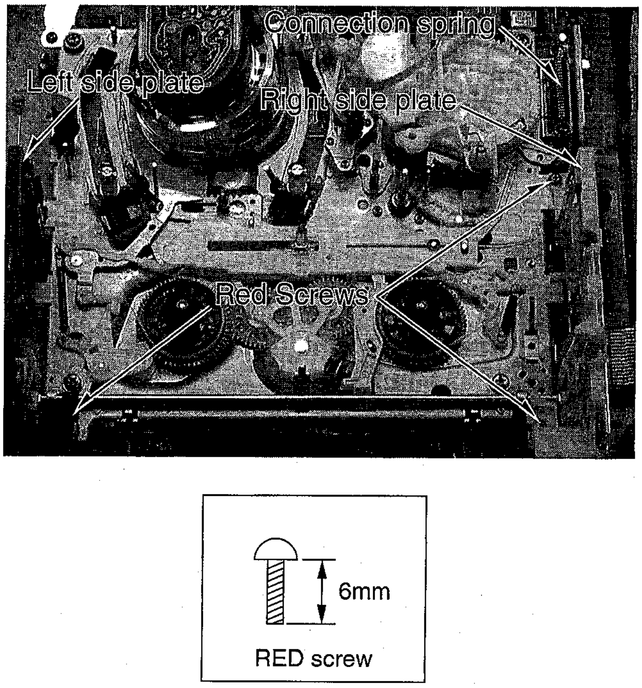

Connection spring
Left side plate
Right side plate
Red Screws
6mm
RED screw

Fig. F4

**SIDE VIEW**

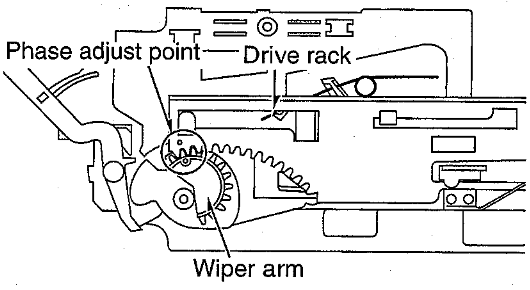

Phase adjust point
Drive rack
Wiper arm

Fig. F5

**TOP VIEW**

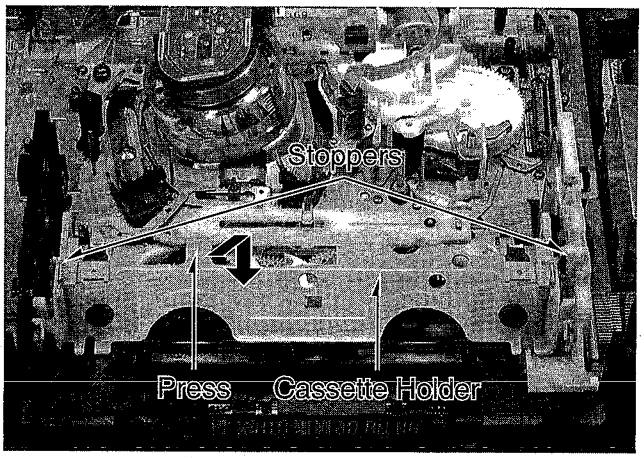

Stoppers
Press
Cassette Holder

Fig. F6

(3) Assembly of Cassette holder

Install Cassette holder so that Cassette holder fits the groove of Waper arm installed in Main shaft (Fig. F6, F7).

**TOP VIEW**

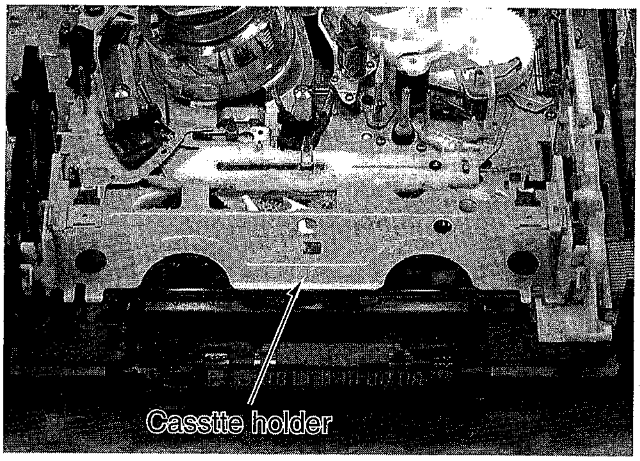

Casstte holder

Fig. F7

(4) Assembly of Top plate

Install Top plate so that Top plate fits the groove of Left and Right side plate.

※ Fix Top plate by tightening screw when the tabs of Left and Right side plate broke (Fig. F8).

**TOP VIEW**

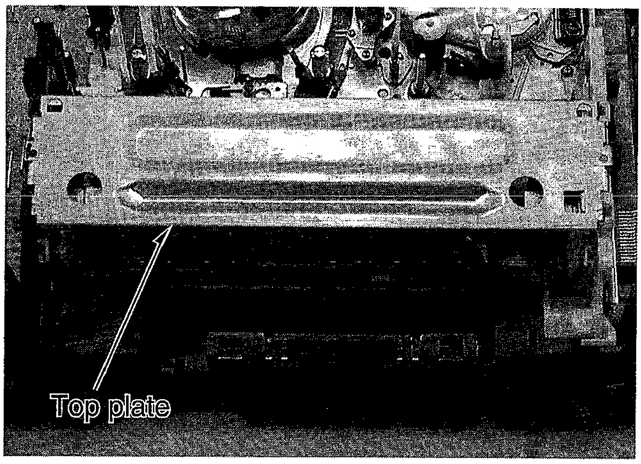
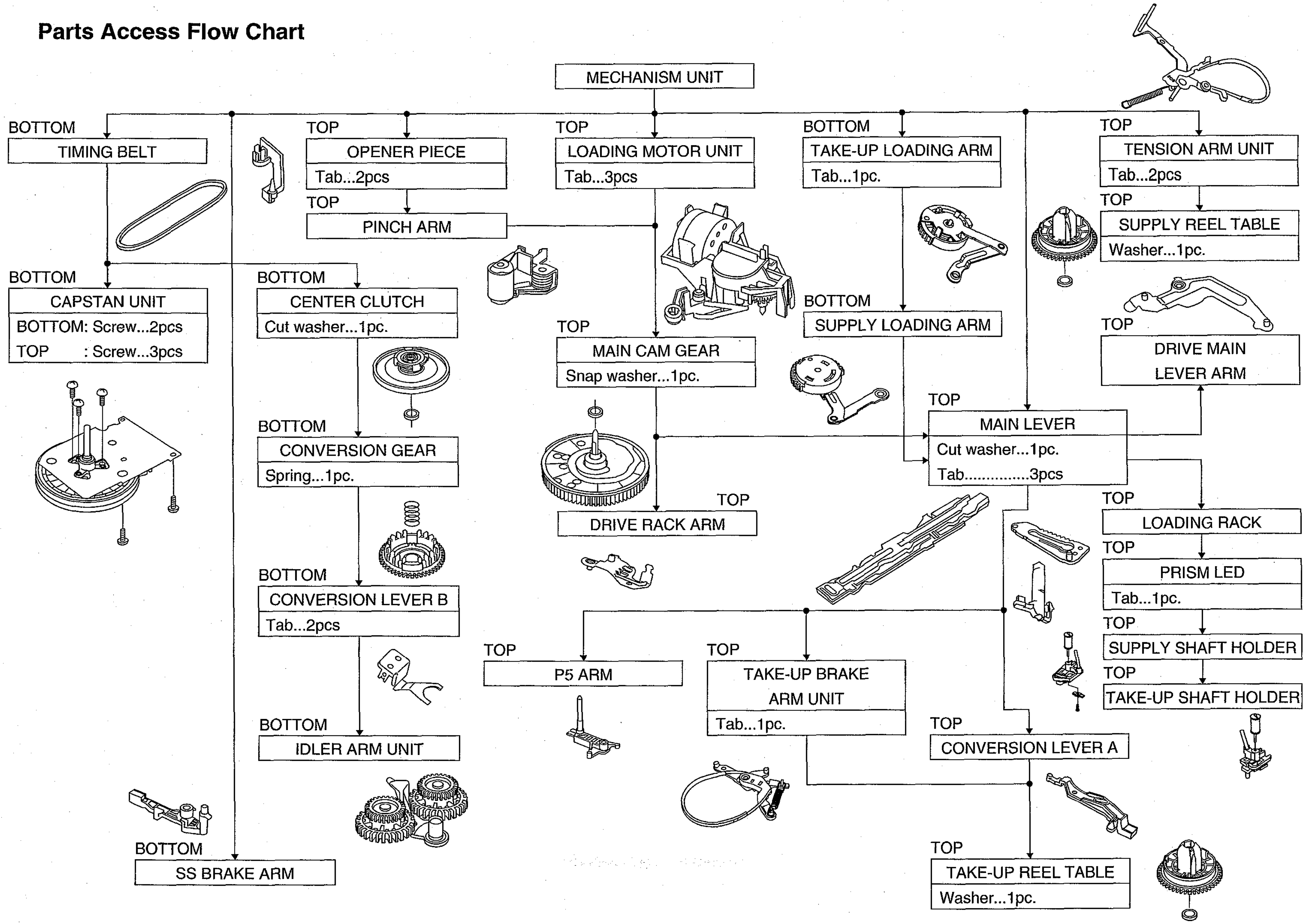


Fig. F8

(5) Install Front panel unit and Top panel

## Parts Access Flow Chart


MECHANISM UNIT
BOTTOM
TIMING BELT
TOP
OPENER PIECE
Tab...2pcs
TOP
PINCH ARM
TOP
LOADING MOTOR UNIT
Tab...3pcs
BOTTOM
TAKE-UP LOADING ARM
Tab...1pc.
TOP
TENSION ARM UNIT
Tab...2pcs
TOP
SUPPLY REEL TABLE
Washer...1pc.
BOTTOM
CAPSTAN UNIT
BOTTOM: Screw...2pcs
TOP : Screw...3pcs
BOTTOM
CENTER CLUTCH
Cut washer...1pc.
TOP
MAIN CAM GEAR
Snap washer...1pc.
BOTTOM
SUPPLY LOADING ARM
TOP
DRIVE MAIN LEVER ARM
TOP
MAIN LEVER
Cut washer...1pc.
Tab..............3pcs
BOTTOM
CONVERSION GEAR
Spring...1pc.
TOP
DRIVE RACK ARM
TOP
LOADING RACK
TOP
PRISM LED
Tab...1pc.
BOTTOM
CONVERSION LEVER B
Tab...2pcs
TOP
SUPPLY SHAFT HOLDER
TOP
TAKE-UP SHAFT HOLDER
TOP
P5 ARM
TOP
TAKE-UP BRAKE ARM UNIT
Tab...1pc.
BOTTOM
IDLER ARM UNIT
TOP
CONVERSION LEVER A
BOTTOM
SS BRAKE ARM
TOP
TAKE-UP REEL TABLE
Washer...1pc.

# 5. MECHANICAL ADJUSTMENT PROCEDURE

## 5-1. Tension post position adjustment

Equipment required: Hex. Wrench (VFK0326)
Specification: 50.5±1.5 mm

(1) Disconnect the AC plug.
(2) Remove the TOP PLATE.
(3) Turn the LOADING MOTOR until the loading completes.
(4) Adjust the hole of Tension Band Fastener by Hex Wrench until the distance between the Tension Post and the center of Supply reel table is 50.5±1.5 mm as shown in Fig. M1.

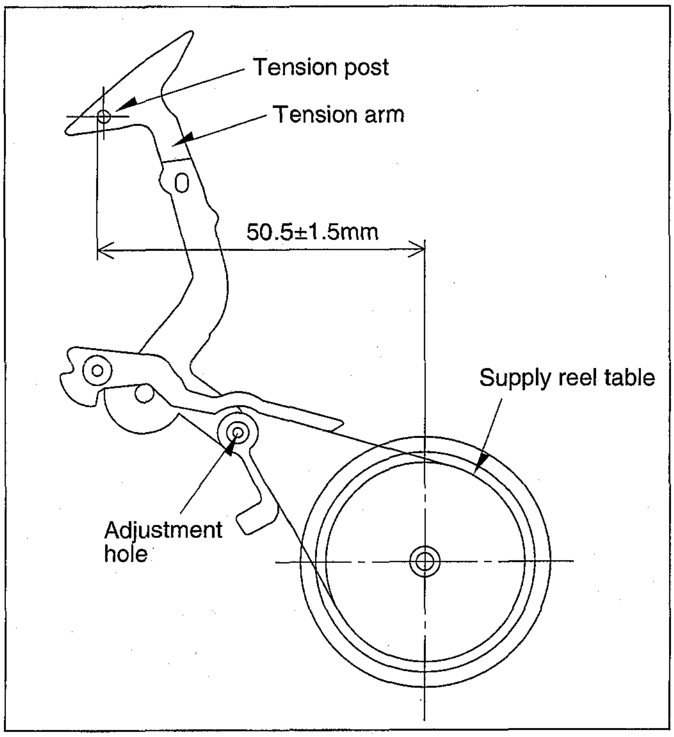

Tension post
Tension arm
50.5±1.5mm
Supply reel table
Adjustment hole

Fig. M1

## 5-2. Back tension adjustment

Equipment required:
Back Tension Meter (VFK0132)
VHS Cassette tape (180 minutes tape: PAL)
VHS Cassette tape (120 minutes tape: NTSC)
Specification: 22.5–27.5g

(1) Playback the cassette tape from the beginning and wait until the tape movement get the stabilization. (for approx. 10–20 seconds)
(2) Insert the Back Tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Fig. M2.

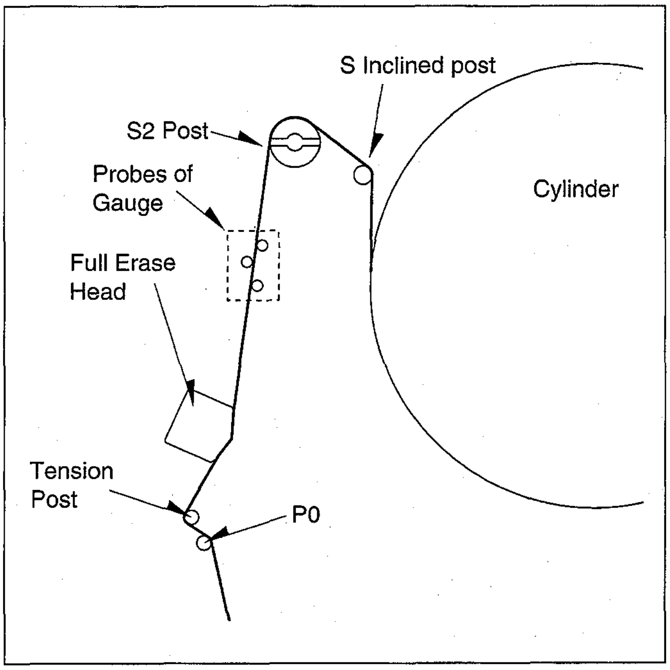

S Inclined post
S2 Post
Probes of Gauge
Cylinder
Full Erase Head
Tension Post
P0

Fig. M2

(3) If it is out of specification, change the spring notch as shown in Fig. M3.

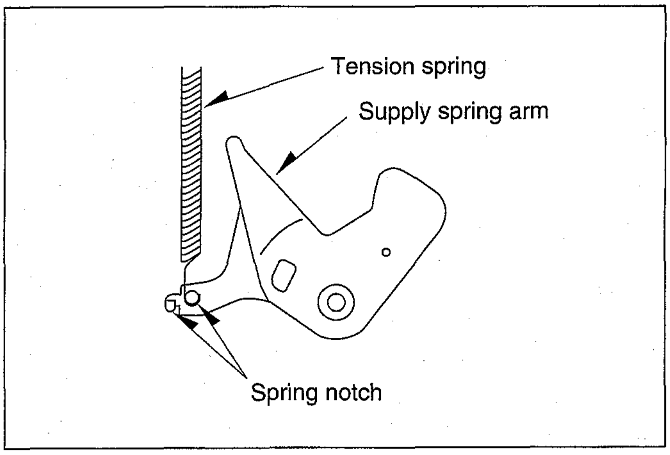

Tension spring
Supply spring arm
Spring notch

Fig. M3

## 5-3. P2 and P3 posts adjustment (PREADJUSTMENT)

Equipment Required:
Post Adjustment Screwdriver (VFK0329)

(1) Remove the Top Plate.
(2) Turn the Loading Motor until the unloading completes.
(3) Rotate the P2 and P3 Posts clockwise to the end. (Fig. M4)
(4) Rotate the P2 and P3 Posts twice counterclockwise. (Fig. M4)

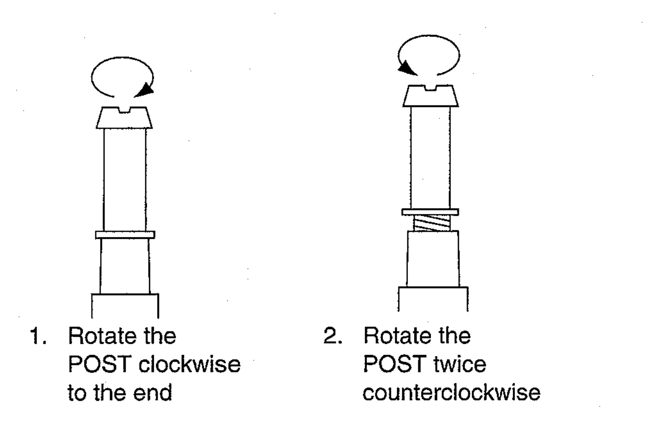

1. Rotate the POST clockwise to the end
2. Rotate the POST twice counterclockwise

Fig. M4

(5) Playback the cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the P2, P3, and P4 Posts as shown in Fig. M5.

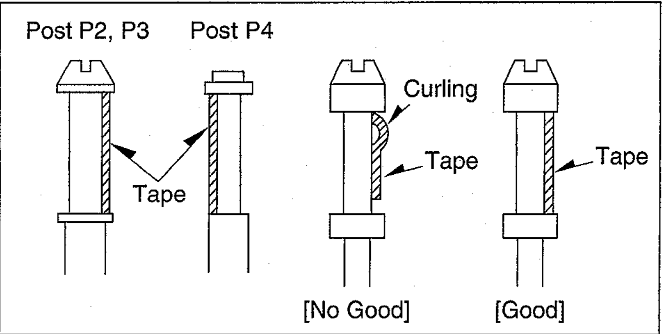


Fig. M5

(6) If the curling appears, readjusts the P2 and P3 Posts.

## 5-4. Tape interchangeability adjustment

Carry out the following procedures for Tape Interchangeability Adjustment to do it correctly and smoothly.

(1) P2 AND P3 POSTS ADJUSTMENT
(2) ADJUSTMENT OF P4 POST
(3) HEIGHT ADJUSTMENT OF A/C HEAD
(4) FINE-ADJUSTMENT OF A/C HEAD
(5) ADJUSTMENT OF X-VALUE (PREADJUSTMENT)
(6) FINE-ADJUSTMENT OF X-VALUE

If the Tape Interchangeability Adjustment is not perfect, repeat the above procedures from (1) to (6).

CAUTIONS: To make an Adjustment Mode for Tape Interchangeability, press the FF and EJECT buttons simultaneously 3 times to set the Service Mode 2.

In case of VCR mounted shuttle ring, turn the shuttle ring to FF and then press EJECT button.

In Loewe model, STOP button is used instead of FF button.

NOTE: Cleaning the Tape Transport path before adjusting of Tape Interchangeability. The detail portion is shown below.
P0 Post, Tension Posts, FE Head, P2 Post, Supply Inclined Post, Cylinder Unit, Take-up Inclined Post, P3 Post, A/C Head, P4 Post, Pinch Roller, Capstan Shaft, P5 Post. FE Head, Cylinder Unit, A/C Head and Capstan Shaft are more important parts and pay an attention to clean them.

## 5-4-(1). P2 AND P3 POSTS ADJUSTMENT

Equipment required:
Alignment Tape (PAL/SECAM: VFJ8125H3F)
(NTSC: VFM8080HQFP)
Post Adjustment Screwdriver (VFK0329)

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

NOTE: To get a stable waveform of the Head Amp output (observation point TW3001 and TW2001 located on Main C.B.A.) on the oscilloscope, use the head switching pulse as a triggering signal as shown in Fig. M6.

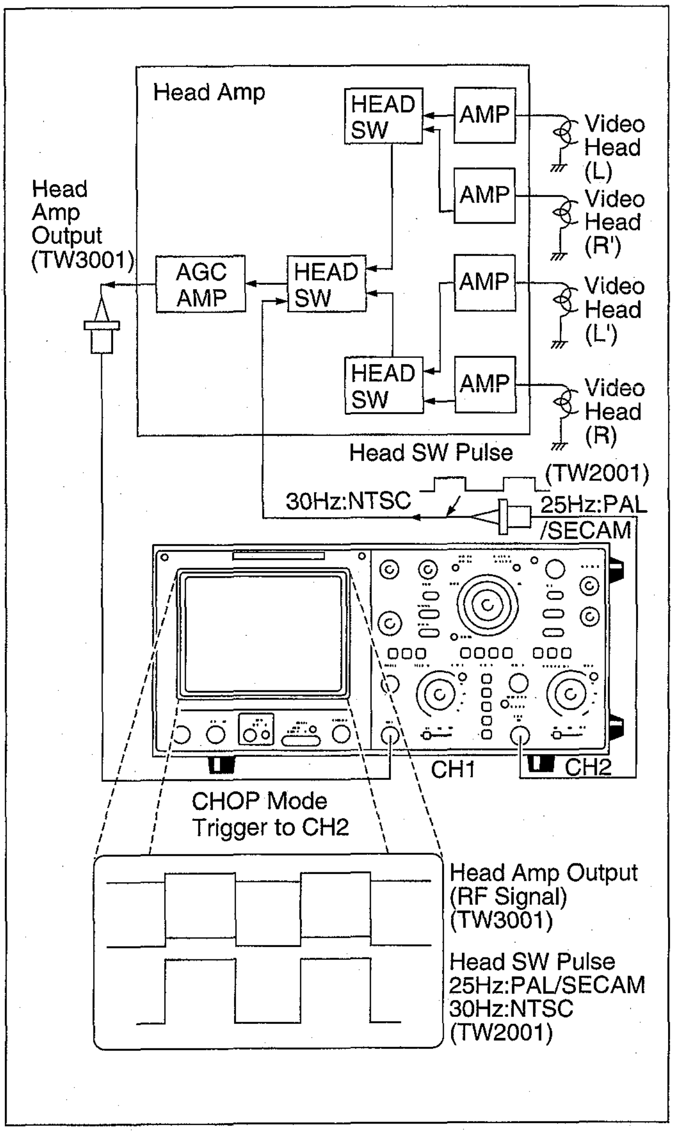

Head Amp
HEAD SW
AMP
Video Head (L)
AMP
Video Head (R')
Head Amp Output (TW3001)
AGC AMP
HEAD SW
AMP
Video Head (L')
HEAD SW
AMP
Video Head (R)
Head SW Pulse
(TW2001)
30Hz:NTSC
25Hz:PAL /SECAM
CH1
CH2
CHOP Mode
Trigger to CH2
Head Amp Output (RF Signal) (TW3001)
Head SW Pulse 25Hz:PAL/SECAM 30Hz:NTSC (TW2001)

Fig. M6 Connect of Oscilloscope

(2) Playback the Alignment Tape.

(3) If the RF envelope appears like example "A" or "B" in Fig. M7, then adjustment of the tape guide post (P2: Entrance) is necessary.

(4) Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Fig. M7 "C".

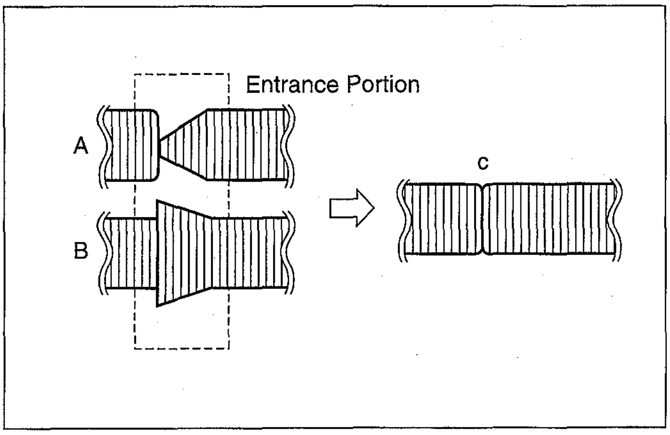

Entrance Portion
A
B
C

Fig. M7

(5) If the RF envelope appears like "D" or "E" in Fig. M8, then adjustment of the tape guide post (P3: Exit) is necessary.

(6) Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Fig. M8 "F".

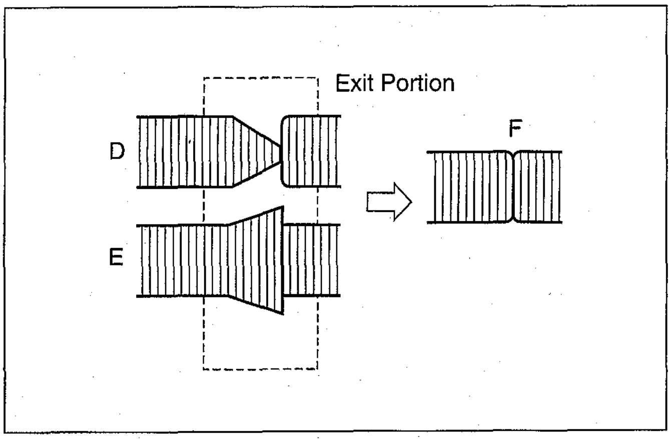

Exit Portion
D
E
F

Fig. M8

(7) Keep pressing the tracking up/down (∧ or ∨) buttons on the remote controller unit. The output envelope should vary nearly parallel with other condition as shown in Fig. M9.

(8) Set the tracking control into center fix position by pressing the tracking up/down (∧ and ∨) simultaneously and adjust for maximum RF envelope, whilst being as flat as possible.

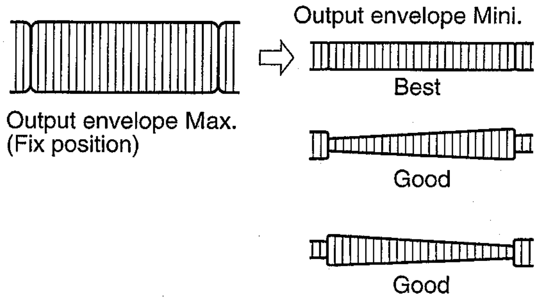


Fig. M9

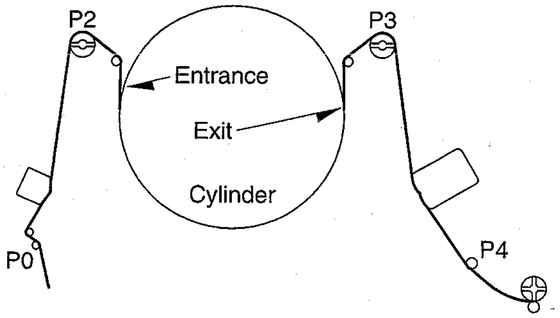


Fig. M10 Loading of Posts

## 5-4-(2). ADJUSTMENT OF P4 POST

(1) Install A/C Head on the Mechanism Chassis by one screw.

(2) Playback the Alignment Tape.

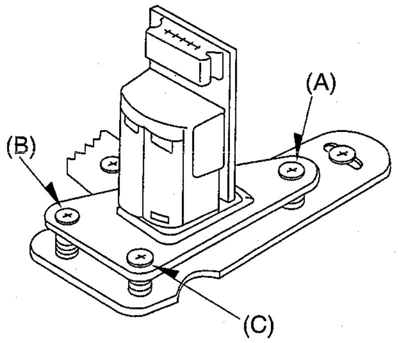
(3) Rotate the screw (A) or (B) until the wrinkle appears on the lower edge of tape at P4 Post.

(4) Rotate the screw (A) or (B) until the wrinkle just disappears on the lower edge of tape at P4 Post.

(5) Connect the oscilloscope to audio output terminal.

(6) Rotate the screw (C) until audio signal is maximized.

NOTE:
1. The relation between the rotation direction of screws (A) and (B) and the condition of wrinkle on the lower edge at P4 Post as shown in Fig. M11.
2. Make sure that there is not the inclined wrinkle between P4 Post and Pinch Roller.



| | SCREW (A) | SCREW (B) |
|---|---|---|
| So wrinkle appears on the lower edge of tape | COUNTER CLOCKWISE | CLOCKWISE |
| So wrinkle disappears on the lower edge of tape | CLOCKWISE | COUNTER CLOCKWISE |

Fig. M11

## 5-4-(3). HEIGHT ADJUSTMENT OF A/C HEAD

<When moving the A/C Head up>

(1) Rotate the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (B) counterclockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) counterclockwise until the audio signal is maximized.

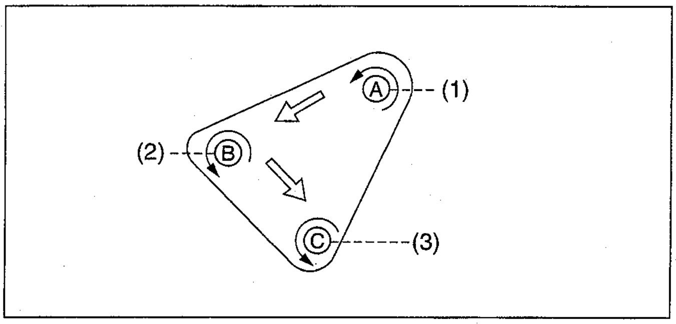


Fig. M12

<When moving the A/C Head down>

(1) Rotate the screw (B) clockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (A) clockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) clockwise until the audio signal is maximized.

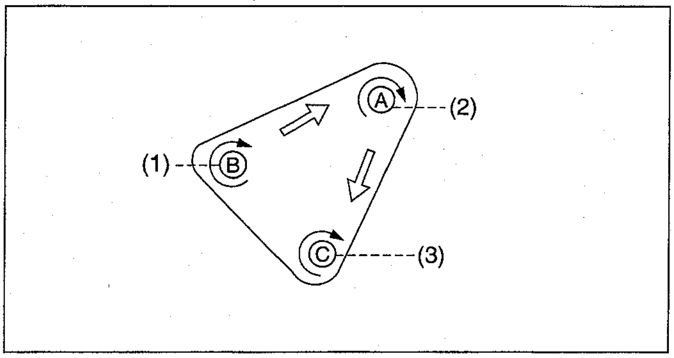


Fig. M13

## 5-4-(4). FINE-ADJUSTMENT OF A/C HEAD

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

(2) Playback the Alignment Tape.

(3) Make sure that the condition of the wrinkle at P4 Post. If the condition of the wrinkle is out of specification, P4 Post adjustment has to be performed as follows.

Turn the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

Turn the screw (A) clockwise until the wrinkle disappears on the lower edge of tape at P4 Post.

(4) Turn the screw (C) until the audio signal is maximized.

NOTE: Make sure that the audio output does not increase when push the upper and lower edges of tape around A/C Head.

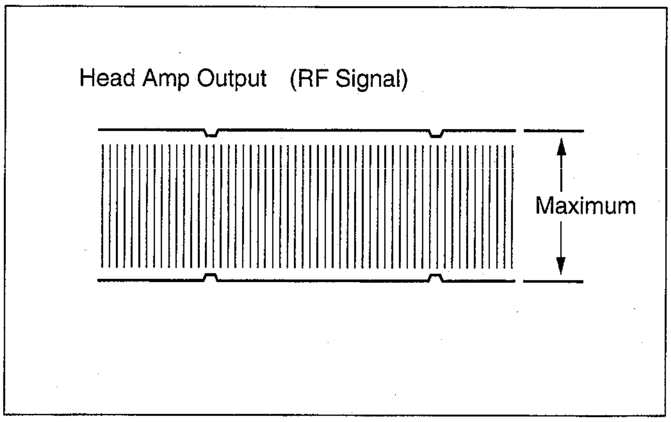


Fig. M14

## 5-4-(5). ADJUSTMENT OF X-VALUE (PREADJUSTMENT)

Equipment required:
Fine Adjustment Gear Drive (VFK0330)
Specification: Less than 15 msec.

(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the Alignment Tape and set the tracking control into center fix position.

(3) Adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) to meet the signal fault portion of the audio output and the video output signals (Less than 15 msec.).

(4) After meeting the signal fault portion, adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) until the video envelope is maximized.

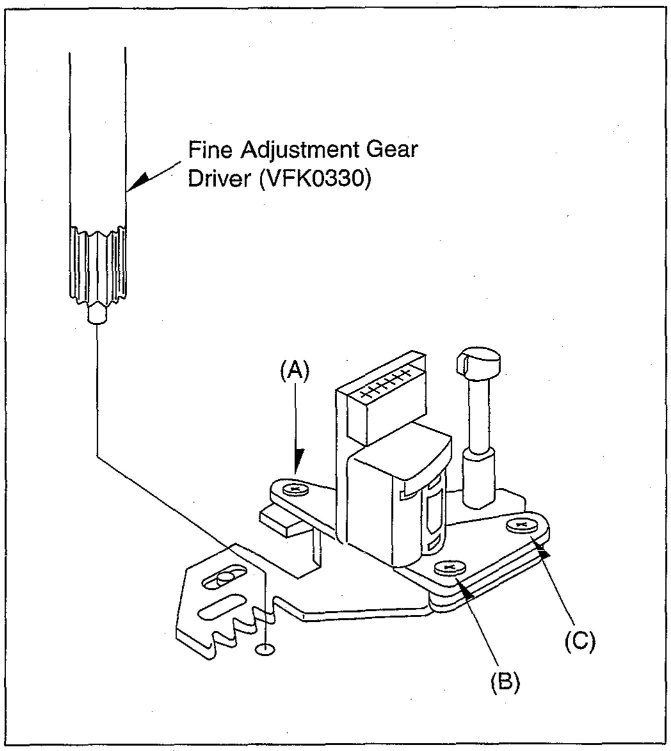


Fig. M15

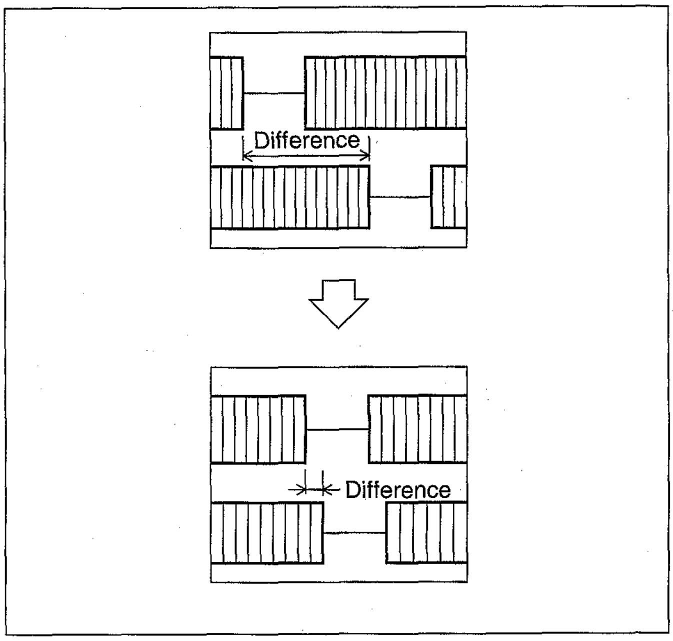


Fig. M16

### 5-4-(6). FINE-ADJUSTMENT OF X-VALUE

Equipment required:
Fine Adjustment Gear Drive (VFK0330)

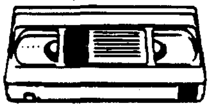
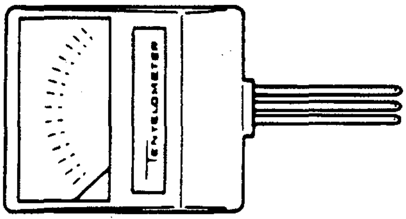
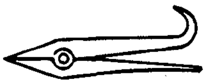
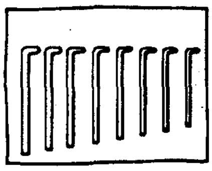
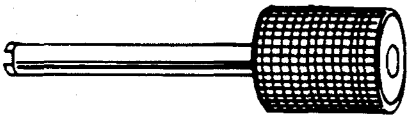
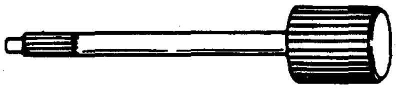
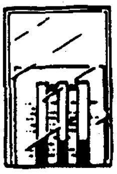
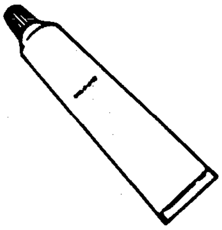
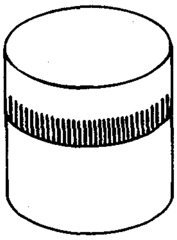
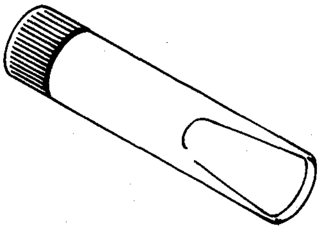
(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the alignment tape and set the tracking control into center fix position.

(3) Adjust A/C Head position by the Fine adjustment Gear Driver (VFK0330) until the video envelope level is maximized at the tracking center fix position.

NOTE: During X-Value Fine Adjustment, in case the video envelope level became 0, Preadjustment of X-value should be adjusted again due to it is possibility to vary the X-value adjustment.

# Servicing Fixtures & Tools

| | | |
|---|---|---|
| VFJ8125H3F<br>PAL VHS Alignment Tape<br>VFM8080HQFP<br>NTSC VHS Alignment Tape<br> | VFK0132<br>Back Tension Meter<br>(Tentelometer, Made in U.S.A.)<br> | VFK0335<br>Retaining Ring Remover<br>(3mm/4mm)<br> |
| VFK0326<br>Hex. Wrench Set<br>(0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)<br> | VFK0329<br>Post Adjustment Screwdriver<br> | VFK0330<br>Fine Adjustment Gear Driver<br> |
| VFK27<br>Hand Cleaning Stick<br> | VFK1024<br>Morlytone Grease<br> | VFK1298<br>Floil Grease<br> |
| VFK1301<br>Silicone Grease<br> | | |

# 6. SELF-TEST INDICATION DISPLAY

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, one of the following fault indication codes will automatically appear in the VTR display. Fault indication codes are displayed in the form of a single English letter followed by two numbers, as for example "H01".

Note: 1. The indication "U" is displayed on the FIP while power remains on.

2. Otherwise, the indication "H" or "F" is displayed on the FIP, and the power is automatically turned off.

   When the power is turned on again, the fault indication code will disappear and the unit will retrun to normal display mode (either clock or counter is displayed).

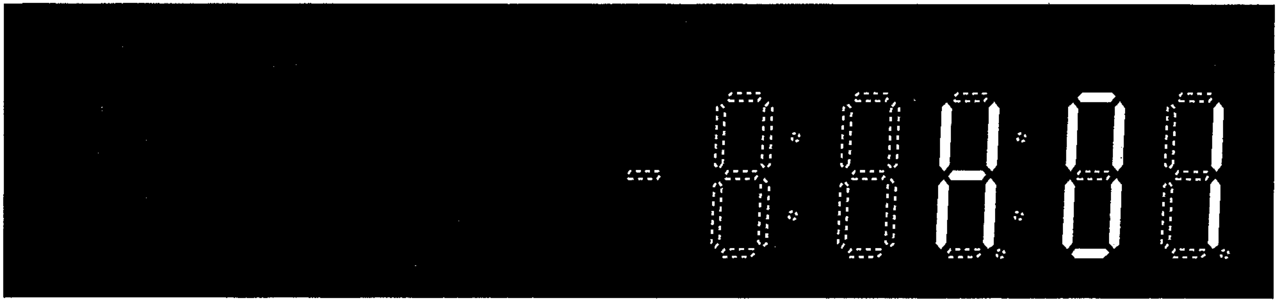
3. This fault indication code will be stored in the microprocessor even with the AC plug disconnected.

   The two-digit number portion of the stored fault indication code can be redisplayed in the FIP's "second" display portion (the last 2 digits on the light) by placing the unit is Service Mode Number 2 when turning on Service Information Display as for example "01" or "02" etc.

   If a second error occurs, only the most recent error will be displayed and stored.

4. To erase the stored fault indication code data, press FF and EJECT buttons for 5 seconds.

< FIP >



| INDICATION | CAUSE | REMEDY/CHECK |
|---|---|---|
| U 10 | Dew formation. | Wait until the indication disappears. |
| H 01 | After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading. | Check the cylinder unit and the cylinder motor drive circuit. |
| H 02 | Cassette tape is not wound up during tape unloading except Eject mode. | Check the capstan unit and the capstan motor drive circuit. |
| F 03 | Mechanism locks during mode transition except Eject mode. | 1. Check the loading motor drive circuit.<br>2. Check the mechanism phase alignment.<br>3. Check the mode switch. |
| F 04 | Mechanism locks during tape unloading. | 1. Check the loading motor drive circuit.<br>2. Check the mechanism phase alignment. |
| F 06 | Mechanism locks after tape unloading in Eject mode. | 1. Check the loading motor drive circuit.<br>2. Check the mechanism phase alignment for cassette holder unit. |
| F 07 | During recording mode recording signal is less than the normal condition. | Protection of the overcurrent flowing in transistor which produce the power supply for recording mode. |
| F 08 | Recording circuit works except recording mode. | Check the recording circuit. |
| H 16 | Cylinder lock detection. | Check the cylinder unit and the cylinder motor drive circuit. |
| H 17 | Supply reel mechanism lock detection. | Check the supply reel mechanism and the supply reel circuit. |
| H 18 | Take-up reel mechanism lock detection. | Check the take-up reel mechanism and the take-up reel circuit. |

Fig. T1 Self-Test indication Display

# 7. SERVICE INFORMATION DISPLAY

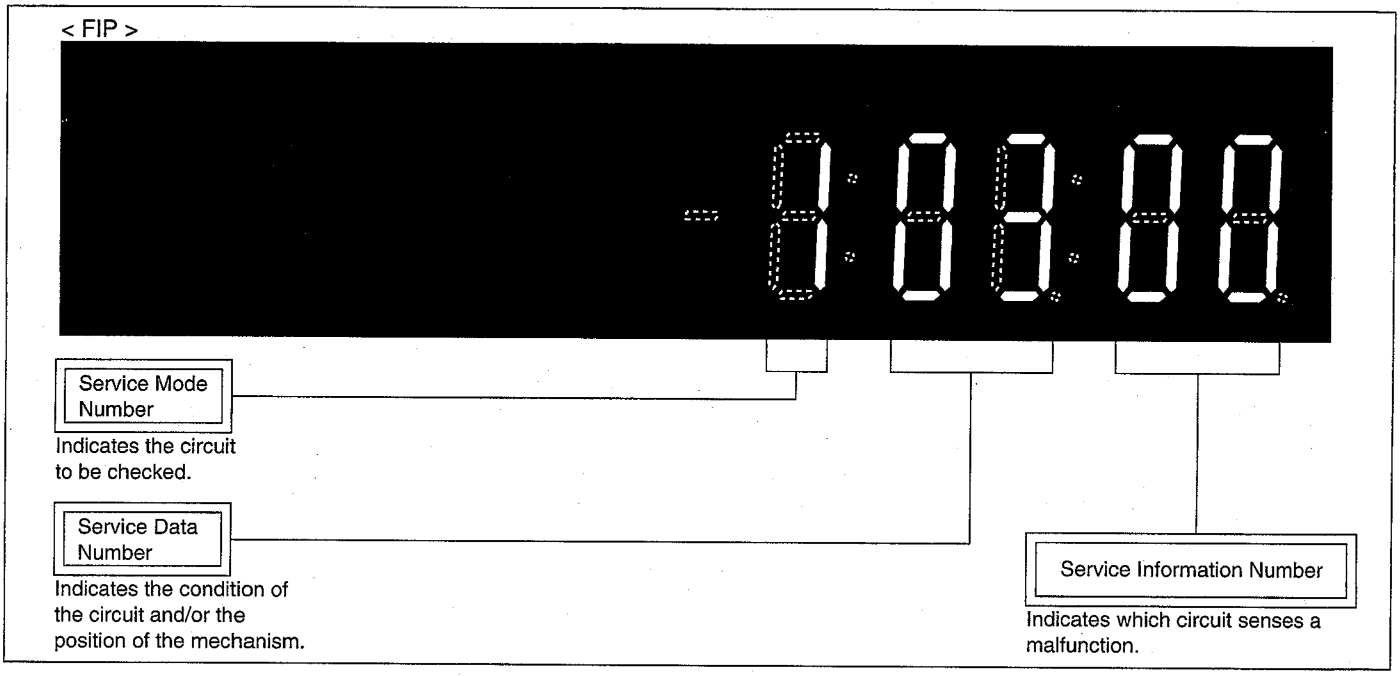

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.
Service Information Number
Indicates which circuit senses a malfunction.

Fig. D1 Service Information Display

## 7-1. Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

## 7-2. Turning on Service Information Display

Press FF and EJECT buttons simultaneously for more than 3 seconds. In case of VCR mounted shuttle ring, turn the shuttle ring to FF and then press EJECT button for more than 3 seconds.

In Loewe model, STOP button is used instead of FF button.

In the Service Information Display, there are four digits divided into 3 functions.

The first digit indicates which of the 7 service modes that the unit is currently in.

MODE 1: Checks tape protection circuit.
MODE 2: Checks tape transport mechanism.
MODE 3: Checks mode switching operation.
MODE 4: Checks control buttons.
MODE 5: Checks capstan motor.
MODE 6: Checks cylinder motor.
MODE 7: Checks loading/unloading operation.

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service infromation display. it is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is not supplied.

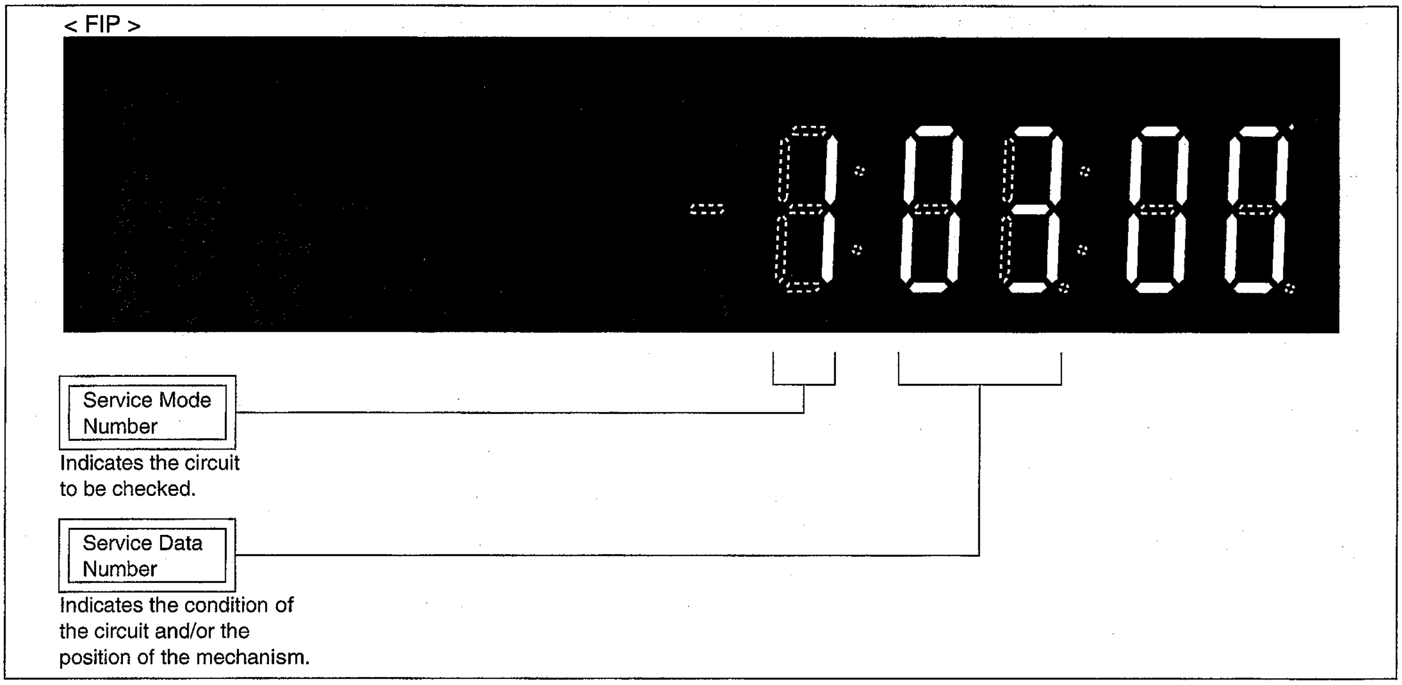

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.

Fig. D2 Service Mode Number and Service Data Number on F.I.P.

## 7-3. Use of Service Modes

(1) Turn on Service information Display.

(2) To change Service Modes, press FF and EJECT buttons simultaneously.

(3) Mode 0: Storing the process number when the fault happened.

(4) Mode 1: Checks that the sensor LED, Supply & Take-up sensor circuits checks the circuits by blocking the light from the sensor LED to either or both Supply & Take-up Sensors. When the light is blocked to both sensors, “00” should be indicated on the service data number.
When the light is blocked to the supply sensor, “01” should be indicated.

(5) Mode 2: Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.

(6) Mode 3: Checks that mode switch circuit operations have been completed.
Service Data Number should indicate “00” after each mechanism operation is completed.

(7) Mode 4: Checks the operation circuit.
Indicates if SYSTEM CONTROL IC receives the operating commands from the mode buttons and/or remote controller.

(8) Mode 5: Checks the capstan motor circuit.
Indicates if the SYSTEM CONTROL IC has received the command to rotate the capstan motor.

(9) Mode 6: Checks the cylinder motor circuit.
SYSTEM CONTROL IC has received the command to rotate the cylinder motor.

(10) Mode 7: Checks the loading/unloading operation.
The loading motor rotates for loading operation when the “PLAY” button is pressed.
The loading motor rotates for unloading operation when the “STOP” button is pressed.
This mode can be displayed indefinitely until the OPERATE button is pressed.

<NOTE> Refer to Fig. D5 for details of Service Data Numbers.

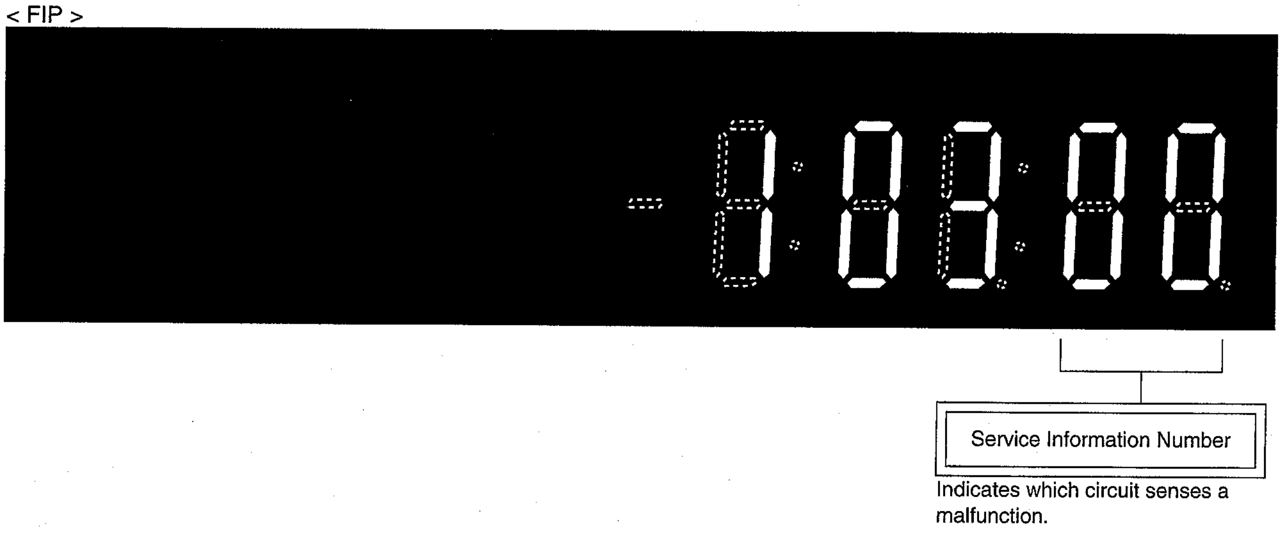

< FIP >
Service Information Number
Indicates which circuit senses a malfunction.

Fig. D3 Service Information Number on F.I.P.

## 7-4. Service Information Number

Refer to Fig. D4 for details of Service Infromation Number.

NOTE: The Service Information Number display is independent of the service mode display. The Service Information Number will be stored as long as AC power is not supplied. (If can be displayed in the Service Mode 2.)

If a second error occurs, only the most recent error will be displayed.

| Service Information Number | Malfunction |
|---|---|
| 00 | Normal condition (No problem) |
| 10 | Dew formation |
| 01 | Cylinder stop |
| 02 | Tape reel stop |
| 03 | Stop at position other than 04 or 06 |
| 04 | Stop during unloading |
| 06 | Stop during Cassette-in/Eject operation |
| 07 | Recording circuit stop in recording mode. |
| 08 | Recording circuit stop except recording mode. |
| 16 | Cylinder lock |
| 17 | Supply reel lock |
| 18 | Take-up reel lock |
| 2* | PG shifter automatic adjustment error |

Fig. D4 Detail Service Information Number

## 7-5. Test Mode

When the test terminals are shorted during turning off condition, the following operation will be performed after AC power is applied. Test Mode Information will be displayed on FIP insted of linear counter. To release Test mode, test Terminales should be opened.

(1) Power will be turned on automatically when AC power is applied.

(2) The direct operation of buttons are able to be performed.
(Examle) PLAY⟷REC, REC→EJECT, REC→FF/REW

(3) In case the mechanism is in PLAY position, the mechanism goes into PLAY mode when AC power is applied.

(4) Playback CVC function is turned off.

(5) Tracking is fixed under power off and cassette in. Auto tracking does not perform.

(6) For recording current adjustment.

(7) For reverse slow tracking adjustment.

(8) When the power is turned off, tracking is fixed.

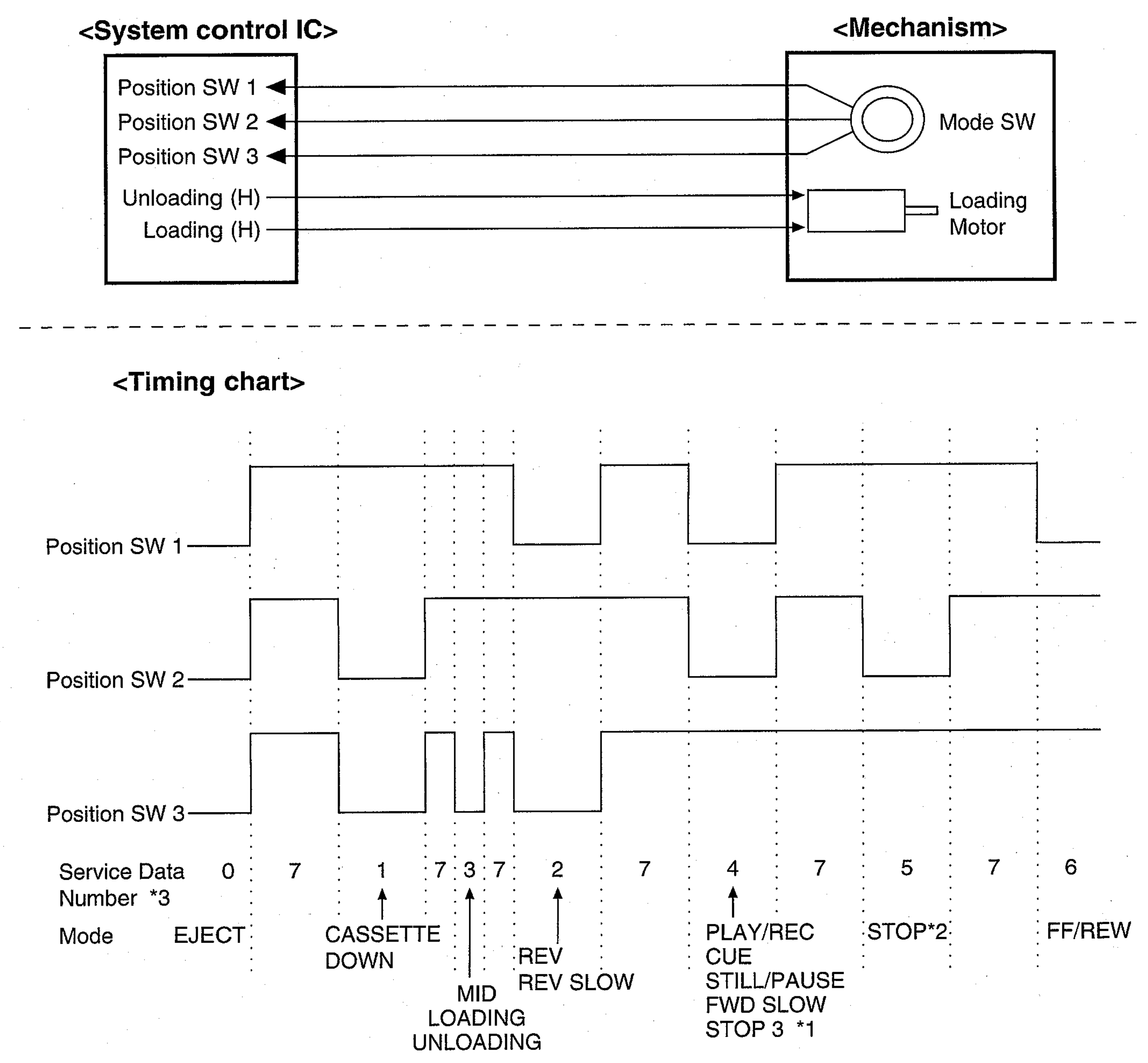
| Service Mode Number | Note for checking Service Data Numbers | Service Data Numbers | Indication | Remarks |
|---|---|---|---|---|
| 1 | — | 00 | No light detected at either sensor | Tape not required. |
| | | 01 | Tape beginning<br>Light to Supply photo sensor is blocked. | |
| | | 02 | Tape end<br>Light to Take-up photo sensor is blocked. | |
| | | 03 | Light detected at both sensors. | |
| 2 | — | 00 | EJECT | Tape required<br>*1. STOP3: Pintch roller is on Capstan motor shaft.<br>*2. STOP: Pintch roller is off Capstan motor shaft. |
| | | 01 | Cassette down | |
| | | 02 | REV, REV SLOW | |
| | | 03 | Loading/Unloading | |
| | | 04 | PLAY, REC, STILL, PAUSE, CUE, FWD SLOW, STOP3*1 | |
| | | 05 | STOP*2 | |
| | | 06 | FF/REW | |
| | | 07 | Intermediate position | |
| 3 | Disregard service data displayed until mechanism operation is completed.<br>Then the display should indicate "00". | 00 | Any display other than "00" indicates a fault in the mode switch circuit or system. | Tape required. |
| 4 | Display only when the operating button is pressed. | | | Tape not required. |
| 5 | Left digit only, disregard Right digit display. | 8 1<br>Left Right<br>Digit Digit | 8, 9, u, A, —, n, L and no display indicate that the Capstan motor "PLAY" command received by System control microprocessor. | Tape required.<br>If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated. |
| | Right digit only, disregard left digit dispaly. | 8 7<br>Left Right<br>Digit Digit | 1, 2, 3, 4, 5, 6, 7 indicate that the Capstan motor "CUE, FF, FWD SLOW" commands received by system control microprocessor. | |
| | Right digit only, disregard left digit display. | 8 —<br>Left Right<br>Digit Digit | 8, 9, u, A, —, n, L and no display indicate that the Capstan motor "Reverse, REW, Reverse Slow" commands received by system control microprocessor. | |
| 6 | Left digit only, disregard Right digit display. | 1 0<br>Left Right<br>Digit Digit | 1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by system control microprocessor. | Tape required.<br>If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated. |

Fig. D5 Service Data Display and Indication

## 7-6. Timing chart from Mode SW to System control IC

System control IC senses the mechanical position through the Mode SW.

Fig. D6 shows the timing for service mode number 2.


<System control IC>
Position SW 1
Position SW 2
Position SW 3
Unloading (H)
Loading (H)
<Mechanism>
Mode SW
Loading Motor
<Timing chart>
Position SW 1
Position SW 2
Position SW 3
Service Data Number *3
0
7
1
7
3
7
2
7
4
7
5
7
6
Mode
EJECT
CASSETTE DOWN
MID LOADING UNLOADING
REV REV SLOW
PLAY/REC CUE STILL/PAUSE FWD SLOW STOP 3 *1
STOP*2
FF/REW

*1 : Stop 3 ;The Pinch roller is on the Capstan motor shaft.
*2 : Stop ;The Pinch roller is off the Capstan motor shaft.
*3 : Service Data Number; This is for Service Mode Number 2.

Fig. D6 Timing chart of Mode SW

# 8. SYSTEM CONTROL CIRCUIT & MECHANISM CONTROL CIRCUIT

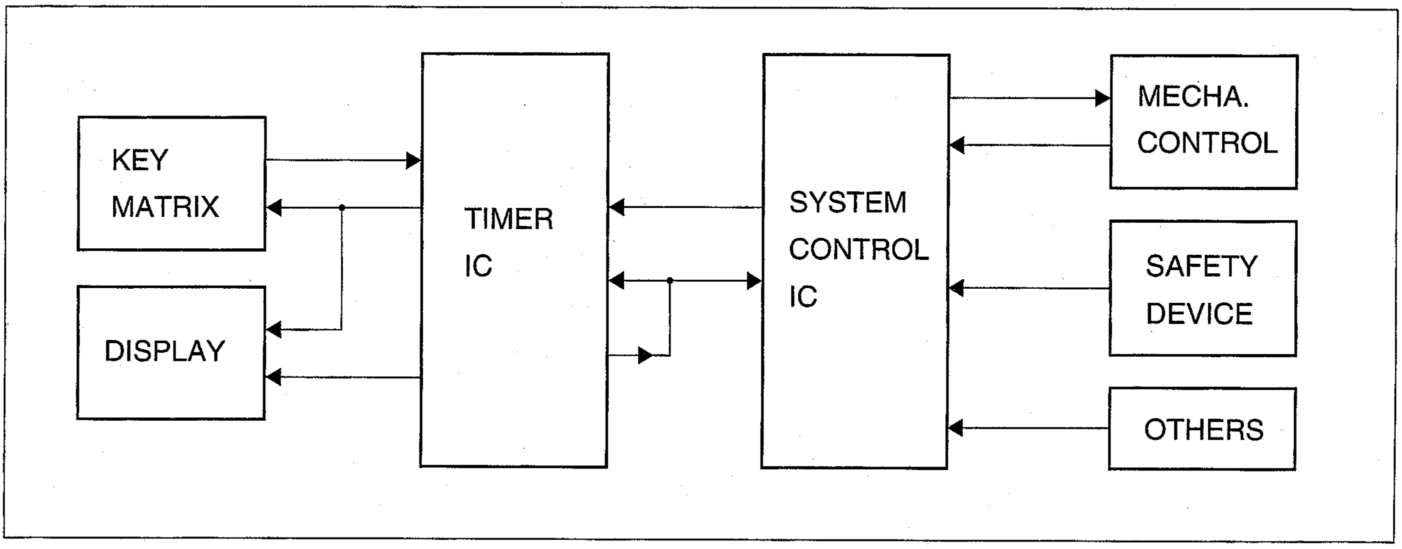


Fig. S1 Overall Block Diagram of System Control Circuit

## 8-1. STOP3 Specification

(1) The STOP3 is the playback stand-by mode.

(2) The unit is put into the STOP3 position after tape loading if the cassette tape does not have a clear leader tape.

(3) If the unit is in the STOP3 position when the power is switched off (included the Timer stand-by mode), the unit goes to the STOP position.

(4) If the cassette is in the unit when the power is turned on, the unit goes to the STOP3 position.

(5) When the cassette tape has clear leader tape, the unit is in loading mode after winding up the clear leader tape by Take-up reel at the cassette down position and the unit goes to STOP3 position.

## 8-2. Stand-by in the STOP3 position

(1) The unit goes to STOP3 position when the Stop mode is selected during the Play or Rec operations. The unit then loosens the tape tension by performing the Reverse Slow.
The Reverse Slow corresponds to the FG 40 pulses of the capstan (irrespective of SP/LP modes). The cylinder continues to rotate.

(2) After about 5 minutes in STOP3 mode, the unit shifts to the Stop position and then the unit stops the cylinder rotation.

## 8-3. Supply and Take-up Sensors

Supply and Take-up photo transistors are used to sense the beginning and end of a tape. The tape has transparent leaders at the beginning and end.

When these transparent leaders enter the tape transport path, they allow infrared light from the sensor LED to reach either one of the tape end sensors (photo-transistor).

If the Take-up end sensor detects the light, the microprocessor SYSTEM CONTROL IC places the VCR in the Stop mode and then performs a short Cue.

If the Supply end sensor is triggered, the microprocessor activates the Stop mode and the Rewind mode. The Rewind mode continues until the Take-up end sensor detects the end of the tape. The tape beginning is detects by a low signal at SYSTEM CONTROL IC Take-up photo terminal. The tape end is detected by a low signal at SYSTEM CONTROL IC Supply photo terminal.

If the light is received at both sensors at same time, the cassette is ejected.

<Operation after detecting the beginning and the end of tape>

| Mode | Detection of the beginning | Detection of the end |
|---|---|---|
| Power off→on | Short CUE | Short REW |
| Cassette in | Short CUE | Short REW |
| Loading | Short CUE | Short REW |
| FF/CUE | —— | Auto REW |
| REW/REV | Short CUE | —— |
| PLAY, REC | —— | Auto REW |
| Timer REC | —— | Power off |

Both ends of tape detection (tape cut, no cassette),

(1) Cassette in: The cassette tape is ejected

(2) Other mode: The unit goes to Stop mode and it is impossible to operate except EJECT key.

(3) Timer REC: Power is turned off after short CUE is performed.

## 8-4. Safety Tab Switch

A recorded video cassette can be protected against accidental erasure by breaking off the tab on the cassette. The cassette can now only be used for playback. To be able to record on the cassette, cover the hole with adhesive tape. If the safety tab on the cassette has been removed, Safety Tab Switch is off (open) and high signal is supplied to SYSTEM CONTROL IC Safety Tab terminal. The SYSTEM CONTROL IC will not go into the recording mode and automatically places the VCR in the playback mode.

## 8-5. Dew Sensor

If excessive moisture or condensation is present inside the machine ( an internal humidity of more than 98%) the unit will stop if running. Until the moisture level decreases only the Eject mode will operate. To sense the humidity, a dew sensor is used. The sensor is a special variable resistor which change resistance with ambient humidity.

The sensor ranges in resistance from about 5K ohm at 90% humidity to about 50K omh at 98% humidity. Normally, the voltage across the sensor is low because of its low resistance.

But if moisture condenses inside the unit, the SYSTEM CONTROL IC voltage of Dew terminal increases to indicate a Dew condition.

| Tape | Mode | Dew sensor ON | Dew sensor OFF |
|---|---|---|---|
| OUT | Power | Compulsory Power on | Power off |
|  | Dew indication | Indicate “d” and “U10” | Normal indication |
|  | Cylinder | Rotating *1 | Stop |
|  | Key operation | Not possible *2 | Possible |
|  | Cassette in | Immediately a cassette is ejected after it goes to cassette down position. | Possible |
| IN | Power | Compulsory Power on | Power off |
|  | Dew indication | Indication “d” and “U10” | Normal indication |
|  | Cylinder | Rotating *1 | Stop |
|  | Key operation | Not possible *2 | Possible |
|  | Cassette condition | A cassette goes to down position and is in stand-by mode. | Stand-by mode at STOP3 position. |

*1: When the cylinder locks in dew mode, it will be released until dew sensor is truned off.

*2: The keys which do not relate to the tape running operation, are able to be used.

| | |
|---|---|
| Dew sensor on: | During Dew formation is detected and 80 minutes after completion of Dew detection. |
| Dew sensor off: | 80 minutes later after copmletion of Dew detection. |

### 8-6. Setting time for each mode

The time is set on each mode in order to protect tape and capstan driver. When the setting time is over, the mode is gone to the next mode.

| Mode | Setting time | Switching mode |
|---|---|---|
| STILL, PAUSE | Approximately 5 minutes | STOP |
| CUE/REV lock | Approximately 10 minutes | PLAY |
| SLOW | Approximately 10 minutes | STOP |

### 8-7. Operation of short CUE

Short CUE stops when the Take-up photo sensor detects the black portion of the tape.

However its sensor does not detect the black portion within 4.0±1.0 sec., the mode except Power on/off and Eject modes will be abe to be operated after the unit stops. This is same as the timer over operation of the reel lock.

### 8-8. Loading/Unloading Mechanism lock

Loading and unloading times are set, and in case the mechanism locks during loading or unloading operation within the defined time, the unit detects the mechanism lock and loading motor reverses or stops.

| | |
|---|---|
| Loading operation lock: | Cassette tape is unloaded and ejected within 5 seconds. |
| Unloading operation lock: | Power is truned off within 5 seconds. |

### 8-9. Cassette loading/unloading lock

(1) Mechanism locks during the cassette in operation.

① Cassette tape is ejected approximately 2 seconds later when the mechanism locks during the cassette in operation.

② In case mechanism locks during eject operation, cassette tape is inserted and power is turned off approximately 2 seconds later.

③ When Mechanism locks during cassette in operation, power is turned off approximately 2 seconds.

In case the mechanism lock is released on the way and cassette is ejected, the unit continues the normal operation.

(2) Mechanism locks during the eject operation.

① Cassette tape goes to cassette down position approximately 2 seconds later and power is turned off when mechanism locks during eject operation.

② Mechanism locks during cassette down operation, power is turned off.

## 8-10. Reel lock operation

When the Suuply or Take-up reel mechanism locks during the tape running, the following operation is performed in order to protect the tape and the capstan driver.

In case of Take-up reel mechanism lock, the detecting time is defined depending on the mechanism position and capstan speed to minimize the tape supplying from supply side.

FF/REW : Unloading and loading. The unit goes to CUE/REV mode.

PLAY/CUE/REV : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

In play and CUE/REV mode, the reel pulse cycle is started to count after the mechanism mode is fixed.

In case the counted pulse cycle exceeds the defined value, the unit goes to STOP mode due to judge that lock of reel mechanism is detected.

<The value of reel lock detection time>

NTSC/SP mode

| Mode | Speed (Ratio) | Time (S) |
|---|---|---|
| PLAY | ±1 | 3.5 |
| CUE/REV | ±2.5 | 1.6 |

PAL/SP mode

| Mode | Speed (Ratio) | Time (S) |
|---|---|---|
| PLAY | ±1 | 3.5 |
| CUE/REV | ±2.5 | 1.6 |

In FF/REW mode, the unit goes to CUE/REV mode and continues the tape running in the following case.

1. (1) Take-up reel pulse can not be detected within 5 seconds after the unit shifted to REW mode.
   (2) Supply reel pulse can not be detected within 5 seconds after the unit shifted to FF mode.
2. The reel pulse can not be detected more than 2 seconds sequentially within 5 seconds after completing the mechanism mode shift.
3. The reel pulse can not be detected more than 800 msec. past 5 seconds after completing the mechanism mode shift.

## 8-11. Cylinder lock

<Start rotation>

When the cylinder neither start rotating nor go to the stability rotation within 5 seconds, it is unloading under keeping the mode. In case the cylinder starts rotating and goes to the stability rotation, the mechanism loads again and continues the holding mode.

If it is not possible, Power is turned off and cylinder trouble "H01" is displayed.

<During rotation>

The head switching pulse is supplied to the cylinder when the cylinder starts the stable revolution. In case the head switching pulse does not come to the cylinder within 0.5 seconds, the cylinder lock is judged and the following operation is activated.

Timer REC mode: Power off

PLAY, REC mode: STOP (Mechanism shifts to MID. position and the unit goes to stand-by mode.)

## 8-12. Mode transition

The relation between the present mode and operation key is shown in the following table.

| PRESET MODE | OPERATION KEY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P SW | EJECT | STOP | REW | FF | PLAY | PAUSE | REC |
| P-OFF | P-ON | EJECT | —— | —— | —— | PLAY | —— | —— |
| EJECT | P-OFF | —— | —— | —— | —— | —— | —— | —— |
| STOP | P-OFF | EJECT | *3 | REW | FF | PLAY | —— | REC |
| REW | P-OFF | EJECT | STOP | REV | FF | PLAY | —— | —— |
| FF | P-OFF | EJECT | STOP | REW | CUE | PLAY | —— | —— |
| REV | P-OFF | EJECT | STOP | —— | *1 | PLAY | *2 | —— |
| CUE | P-OFF | EJECT | STOP | *1 | —— | PLAY | *2 | —— |
| PLAY | P-OFF | EJECT | STOP | *1 | *1 | —— | *2 | —— |
| STILL | P-OFF | EJECT | STOP | *1 | *1 | PLAY | PLAY | REC PS |
| REC | P-OFF | —— | STOP | —— | —— | —— | REC PS | —— |
| REC/PS | P-OFF | —— | STOP | —— | —— | —— | REC | REC |

Pressing two keys simultaneously, the key operation is going to be ineffective.

*1: The unit goes to CUE/REV lock mode by pressing FF/REW key lightly (less than 0.7 seconds) during Play, still and REV mode. CUE/REV mode will be returned previous mode when FF/REW key is pressed more than 0.7 seconds.

*2: In case PAUSE key is pressed less than 1 second other than STILL mode, the unit goes to STILL mode.
If PAUSE key is being held to press, the unit goes to STILL mode and then goes to 1/10 SLOW mode after 1 second. SLOW mode has not been set in 2 Head LP mode model.

*3: When STOP key is pressed more than 3 seconds while a cassette tape is in the unit, the cassette tape is ejected.

## 8-13. Power on reset

When the power is turned on, the unit is going to reset and the following datas are cleared.

(1) Position switch data
(2) Operation mode data
(3) Prohibition flags

In case the mechanism is in cassette down position, tape slack is removed as the initial operation and the unit goes to STOP3 position.

## 8-14. Linear time counter operation

The counter value will be gone up/down by counting control pulse. As for NTSC system during Play/Rec mode, counter value goes up/down every 30 pulses. As for PAL system during Play/Rec mode, counter value goes up/down every 25 pulses.

### 8-15. Tape speed in CUE/REV mode

| | CUE/REV mode | | Hyper-search mode | |
|---|---|---|---|---|
| MODE | NTSC | PAL | NTSC | PAL |
| SP mode | 9 times | 11 times | 9 times | 11 times |
| EP or LP mode | 11 times | 11 times | 29 times | 19 times |

### 8-16. Automatic functions

(1) Automatic Power on

① Under power off, when a cassette tape is inserted, power is turned on automatically and cassette tape is loaded.

② Under power off and a cassette tape has been inserted, when PLAY key is pressed, power is turned on automatically and goes to PLAY mode.

(2) Automatic play

When a cassette tape removed safety tab is inserted, the mode goes into Play mode.

(3) Automatic rewind

When tape running is reached to the end of tape, automatically goes to Rew mode and stops when tape running will be reached to the beginning of tape.

In case of Timer recording, short Rew is performed for 2 seconds and power is turned off when tape running is reached to the end of tape.

(4) Power off and Eject

Under power off and a cassette tape has been inserted, when Eject key is pressed, a cassette tape is ejected and power is turned off.

### 8-17. CUE/REV lock mode

When FF/REW key is pressed lightly (less than 0.7 seconds) during Play, STILL and REV mode, unit goes into CUE/REV mode. To release CUE/REV mode, FF/REW key should be pressed more than 0.7 seconds.

### 8-18. Hyper-search mode

When FF/REW key is pressed during FF/REW mode, unit goes into CUE/REV mode.

This mode is activated while keeping FF/REW key pressed.

When releasing FF/REW key pressed, this mode is released.

### 8-19. FF/REW speed

Maximum tape speed is approximately 4.5 m/s during the stable running.

### 8-20. FF/REW time

The tape running from the beginning to the end of T-120 type (E-180 type) cassette tape is able to be completed within 90 seconds.

Order No. VRD9710036S3

# Service Manual

Supplement

## Video Product

Model No. All Z mechanism

Effective from : Running Change

## Subject : Change of Mechanism Parts

Please use this service manual together with the service manual for Order No.
Model No. All Z mechanism

**INTERCHANGEABILITY CODE** See the I/C column on the following Part Number List

| | Parts | Production | | Parts | Production | | Parts | Production | | Parts | Production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Original | Early | B | Original | Early | C | Original | Early | D | Original | Early | E | Addition |
| | New | Late | | New | Late | | New | Late | | New | Late | F | Deletion |
| | | | | | | | | | | | | G | Other |

**Parts Number List**

| Ref No. | Original Part No. | New Part No. | Part Name & Description | I/C | Remarks |
|---|---|---|---|---|---|
| 19 (1) | VED0363 | VED0412 | A/C HEAD UNIT | B | |
| 49 (1) | VXL2737 | VXL2733 | SUPPLY BRAKE ARM UNIT | G | |

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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Order No. VRD9802006S3

# Service Manual

Supplement

## Video Product

Effective from : First Production

Model No.
ALL Z Mechanism

## Subject : Revision of Service Manual

Please use this service manual together with the service manual for Order No.
Model No. All Z Mechanism

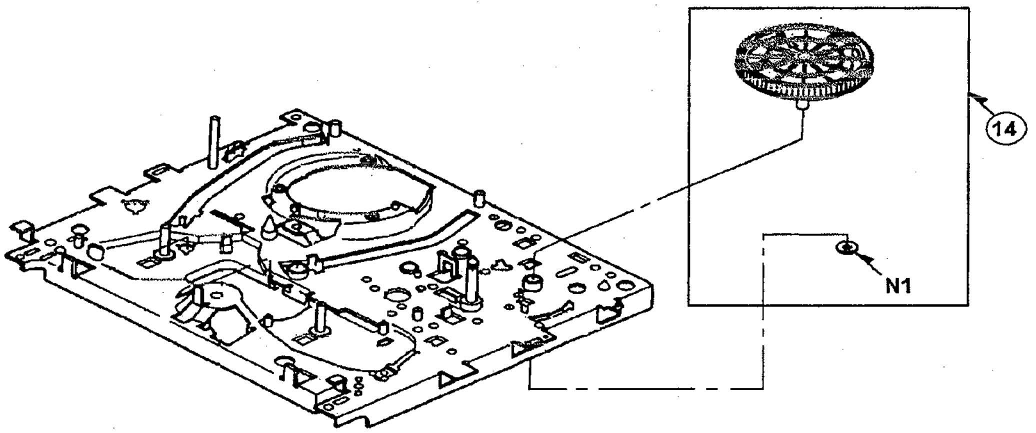
**INTERCHANGEABILITY CODE** See the I/C column on the following Part Number List

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parts | Production | | Parts | Production | | Parts | Production | | Parts | Production | E | Addition |
| A | Original | Early | B | Original | Early | C | Original | Early | D | Original | Early | F | Deletion |
| | New | Late | | New | Late | | New | Late | | New | Late | G | Other |

**Parts Number List**

| Ref No. | Original Part No. | New Part No. | Part Name & Description | I/C | Remarks |
|---|---|---|---|---|---|
| 14 (1) | VDG1220 | VDG1220KIT | MAIN CAM GEAR KIT | G | |

MAIN CAM GEAR KIT (VDG1220KIT) contains MAIN CAM GEAR (VDG1220) and PUSH NUT (VHN0311) as shown in below.



### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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